



INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN AND ENVIRONMENTAL ASSESSMENT



**U.S. COAST GUARD
TRAINING CENTER,
CAPE MAY, NEW JERSEY**

MARCH 2003

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN and ENVIRONMENTAL ASSESSMENT



U.S. COAST GUARD TRAINING CENTER CAPE MAY, NEW JERSEY

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U.S. COAST GUARD
U.S. COAST GUARD TRAINING CENTER CAPE MAY
CAPE MAY, NEW JERSEY

This Integrated Natural Resources Management Plan (INRMP), dated March 2003 has been prepared in accordance with regulations, standards, and procedures of the Department of Transportation (DOT), the U.S. Coast Guard (USCG), and in cooperation with the U.S. Fish and Wildlife Service (FWS) and the New Jersey Department of Environmental Protection (NJDEP) – Division of Fish and Wildlife. The management of natural resources in this INRMP reflects the mutual agreement of all parties. While there is no legal requirement for this agreement, the USCG Training Center Cape May (hereafter referred to as TRACEN Cape May) is dedicated to stewardship of natural resources and ecosystems while protecting their training mission. All parties have entered into this agreement voluntarily.

To the extent that resources permit, the FWS, NJDEP – Division of Fish and Wildlife, and the USCG by signature of their agency representative, do hereby agree to enter a cooperative agreement program for the conservation, protection, and management of fish, plant, and wildlife resources present on TRACEN Cape May, New Jersey. The intention of this agreement is to develop functioning, sustainable ecological communities on TRACEN Cape May that integrates its mission and the mission of the agencies charged with conservation, protection, and management of national heritage in the public interest. It is also the goal of this agreement to establish sound ecological management principles for the continued protection of sensitive plant and wildlife species and their associated habitats. This agreement may be modified and amended by mutual agreement of the representatives of the three agencies. This agreement will become effective upon the date of the last signatory and shall continue in full force for a period of five years or until terminated by written notice to the other parties, in whole or in part, by any of the parties signing this agreement. By their signatures below, or an enclosed letter of concurrence, all parties grant their concurrence and acceptance of the following document.

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Date

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Division of Fish and Wildlife

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EXECUTIVE SUMMARY

This Integrated Natural Resources Management Plan (INRMP) has been developed for U.S. Coast Guard (USCG) Training Center (TRACEN) Cape May in accordance with USCG Commandant Instruction (COMDTINST) M5090.3, *Natural Resources Management*, COMDTINST M16475.1D, *National Environmental Policy Act, Implementing Procedures and Policy for Considering Environmental Impacts*, and Department of Transportation (DOT) Order 5610.1C, *Procedures for Considering Environmental Impacts*. While there is no legal requirement for the DOT or USCG Installations to prepare an INRMP, TRACEN Cape May and the USCG have decided to formulate and implement this INRMP to ensure the continued operation of their mission while also implementing the latest strategies for promoting ecological structure and function. In addition, this INRMP provides long-term management of the Installation's sensitive species and habitats.

This INRMP provides TRACEN Cape May with a description of the Installation and its surrounding environment, and presents various management practices designed to mitigate negative impacts and enhance the positive effects of the TRACEN's mission on regional ecosystems. These recommendations have been balanced against the requirements of TRACEN Cape May to accomplish its mission at the highest possible level of efficiency. To obtain an accurate assessment of the TRACEN's influences, analyses were conducted to determine the physical and biotic nature of TRACEN Cape May and its surrounding environment, as well as the operational activities taking place.

The findings of this analysis led to the formation of this INRMP. The foundations of this plan have been developed from the current natural resources management program. Management of the Installation has long taken into account the unique ecosystem in which it operates and has integrated the needs of the environment into the operational mission. This INRMP represents a consolidation of past management actions on the Installation as well as a direction toward the future.

This INRMP is a guide for the management and stewardship of all natural resources present on TRACEN Cape May, while ensuring the successful accomplishment of the training mission. A multiple-use approach was used to allow for the presence of mission-oriented activities while effectively managing the natural resources to conserve biodiversity and environmental quality.

The INRMP was developed using an interdisciplinary approach and information gathered from a variety of organizations. Information and guidance was also solicited from a variety of Federal, state, and local agencies and groups. An INRMP Focus Group was formed, which included key TRACEN Cape May personnel and individuals from various agencies and groups that have an interest in TRACEN Cape May and the management of its resources. Representatives from the following Federal, state, and local regulatory agencies and groups comprised the Focus Group: the U.S. Fish and Wildlife Service (FWS), New Jersey Department of Environmental Protection (NJDEP) Division of Fish and Wildlife, U.S. Department of Agriculture (USDA) – Natural Resources Conservation Service (NRCS), and the New Jersey Audubon Society.

The INRMP Focus Group ensured that information concerning the natural resources on or in the vicinity of the TRACEN Cape May was accurate and presented with acknowledgment of local and regional management strategies. As a result, the probable effects of TRACEN Cape May operations on the surrounding natural resources will be projected. This approach also allowed for

insight into possible operational alternatives, which may result in reduced impacts to the natural resources on the TRACEN and in surrounding areas.

Neither the DOT nor the USCG is required by the Sikes Act Improvement Act (Sikes Act) (16 U.S.C. 670a et seq) to prepare an INRMP in conjunction with the FWS and the state department of Fish and Wildlife. The Sikes Act governs the actions for Department of Defense Installations in the management of natural resources. While the DOT is not required to prepare an INRMP cooperatively with the FWS and the state Fish and Wildlife agency, the general philosophy and requirements of the Sikes Act have been followed during the preparation of this INRMP to ensure proper management of TRACEN Cape May's threatened and endangered species, sensitive habitats, flora, fauna, and ecosystems structures and functions. Participation on the INRMP Focus Group and the cooperative preparation of this Plan by representatives from the FWS and the NJDEP – Division of Fish and Wildlife mimics the provisions of the Sikes Act. The resulting Plan reflects the mutual agreement of the parties concerning conservation, protection, and management of fish and wildlife resources.

The maintenance and enhancement of biological diversity is particularly important in the management of natural resources and will be accomplished through the implementation of specific management practices identified in this INRMP. Biodiversity is simply defined as "the variety of life and its processes." Biodiversity does not describe how many species there are or how evenly they are represented in a given community. Rather, biodiversity can be applied on four basic levels: genetic diversity, species richness, ecosystem diversity, and landscape diversity. Genetic diversity refers to the variation of genotypes within a species that influences different characteristics among individuals or populations. Species richness refers to the number of different kinds of species within a given area. Ecosystem diversity refers to the variety of ecosystems across a given landscape. Finally, landscape diversity refers to the variation of the ecosystems that interact across a large land area. By protecting habitats that support the greatest variety of life and its processes, this INRMP will help perpetuate viable populations of native species and communities.

The INRMP presents practicable alternatives and recommendations that can ensure minimal impact to the TRACEN Cape May's missions while providing for the management and stewardship of natural resources as well as the conservation and enhancement of existing ecosystems on the Installation. Consequently, in some cases the implementation of some of these recommendations sacrifices the improvement of the TRACEN Cape May's natural resources in deference to the safety and efficiency of the USCG mission. Constraints to the mission are summarized in Figure ES-1 and are further described throughout the INRMP.

The overriding goals for this INRMP are to:

1. Manage for no net loss in TRACEN Cape May's capability to support mission of the Installation,
2. Minimize habitat fragmentation and promote the natural connectivity of habitats and communities,
3. Protect native species and discourage non-native, exotic species,
4. Protect rare and ecologically important species and unique or sensitive environments,
5. Maintain or mimic natural processes,
6. Protect genetic diversity,



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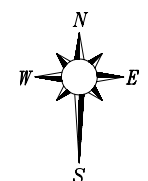
- Base Boundary
- High-Tide Line
- Dredge Spoil Areas
- TRACEN Detail

Non-Natural Resource Areas:

- Improved Areas
- Residential Areas
- Roads/Impervious Surfaces
- Outdoor/Recreation

Natural Resources Constraints:

- Forested
- Sensitive Species
- Open Spaces
- Wetlands



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Figure ES-1. Composite Natural Resources Constraints at TRACEN Cape May

7. Rehabilitate ecosystems, communities, and species; and
8. Monitor biodiversity impacts.

From these goals and objectives, management actions were identified that structure this plan's guidance. However, each of the management strategies described in this INRMP should be monitored so that modifications can be made during implementation as conditions change.

Throughout the development of this INRMP, management issues were identified in a number of natural resources subject areas. Some of these natural resources topics of concern could have an adverse impact on TRACEN Cape May's mission or future planning operations. The potential negative impacts could range from delays in the construction of new buildings to violation of local, state, or Federal regulations. One of the purposes of this INRMP is to identify goals and objectives in order to obtain workable and useful solutions for each topic of concern. The issues identified in the following list have a schedule for their resolution presented in Section 5. The topics of concern involving natural resources constraints to planning and mission operations are presented in the following paragraphs.

1. TRACEN Cape May personnel require the appropriate guidance on an ecosystem management approach to natural resources management. Successful implementation of ecosystem management protocols will ensure that the mission is not compromised due to violations of natural resources law and regulations.
2. There is problem of unauthorized access to the Installation via Cape May Beach access into TRACEN beaches. Signage and fencing is present on the southwest beach access, but during low tide, the signs are far away from the low water line and can not be seen. Signs can not be posted at the low tide mark, as they tend to wash away. Not only is the beach area managed as the Sensitive Species Land Management Unit, it also represents an area where authorized individuals could potentially gain access to the Installation.
3. Nesting populations of piping plover (federally threatened, state endangered), black skimmer (state endangered), and least tern (state endangered) are known to occur on the beaches of TRACEN Cape May. Strict guidelines are in place that controls the management of these species. Management of these populations is a priority to the mission of the USCG.
4. Under the Endangered Species Act, any potential activity that could impact the success of the beach nesting birds or other threatened or endangered species must go through a consultation process with the United States Fish and Wildlife Service. Failure to follow this process could violate federal law, significantly delaying and/or halting projects.
5. Surveys determined that isolated patches of seabeach amaranth (*Amaranthus pumilus*) occur as far south as Upper Township, Cape May County, New Jersey. This plant has the potential to occur at the TRACEN in future years. The USCG obligations of Section 7(a)(1) of the Endangered Species Act apply to seabeach amaranth. FWS anticipates a southern expansion of this species into new areas which could potentially include TRACEN Cape May. Occurrence of this species could limit use of areas if found outside of the Sensitive Species Land Management Unit.
6. Although 27 acres of wetlands have been mapped at TRACEN Cape May, confirmation of the location and extent of the freshwater wetlands is necessary to

ensure that inadvertent violations do not occur in the future. Confirmation is also necessary to ensure that appropriate permits are obtained before encroachments into areas occur.

7. Without proper maintenance of the southern jetty, the channel by which the USCG accesses the Atlantic Ocean would become silted and would require constant dredging. In addition, this jetty protects the Sensitive Species Land Management Unit by protecting the beaches from severe storm events. Proper maintenance of this structure is critical to both the mission of the USCG and to natural resources management at TRACEN Cape May.
8. Pest management objectives at TRACEN Cape May include the protection of real estate, control of potential disease vectors or animals of other medical importance, control of undesirable or nuisance plants and animals (including insects), and prevention of damage to natural resources. Control of these species allows accomplishment of the mission without destruction of property or negative effects to human health or welfare.
9. USCG TRACEN has a centralized heating plant that has the potential to emit (PTE) over 1000 tons of air emissions per year. Decentralization of this facility will allow an actual reduction of approximately 90 tons of pollutants released into the air per year.

A summary of all changes made to this document since the signatory date as well as description forms for all new projects to be included in the next revision of the INRMP can be found in Appendix M of this document.

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1. INTRODUCTION

1.1 PURPOSE AND GOALS OF THE PLAN

This Integrated Natural Resources Management Plan (INRMP) has been developed for use by U.S. Coast Guard (USCG) and the USCG Training Center (TRACEN) Cape May, New Jersey in accordance with USCG Commandant Instruction (COMDTINST) M5090.3, *Natural Resources Management*, COMDTINST M16475.1D, *National Environmental Policy Act Manual*, and Department of Transportation (DOT) Order 5610.1C, *Procedures for Considering Environmental Impacts*.

This INRMP provides TRACEN Cape May with a description of the Installation (e.g., location, history, and mission), information about the surrounding physical and biotic environment, and an assessment of the impacts to natural resources as a result of mission activities. Furthermore, the INRMP recommends various management practices, in compliance with Federal, state, and local standards, designed to mitigate negative impacts and to enhance the positive effects of the TRACEN's mission on local ecosystems.

This INRMP integrates all aspects of natural resources management with the rest of the TRACEN Cape May's mission, and therefore becomes the primary tool for managing the TRACEN's ecosystems while ensuring the successful accomplishment of the training, law enforcement, and Search and Rescue (SAR) missions at the highest possible levels of efficiency. The INRMP is a guide for the management and stewardship of all natural resources present at the TRACEN. A multiple-use approach will be implemented to allow for the presence of mission-oriented activities, as well as environmental quality through the efficient management of natural resources.

Specific management practices identified in this INRMP have been developed to enhance and maintain biological diversity within TRACEN Cape May and its associated coastal ecosystem. Specifically, management practices should:

1. Manage for no net loss in TRACEN Cape May capability to support mission of the Installation,
2. Minimize habitat fragmentation and promote the natural connectivity of habitats and communities,
3. Protect native species and discourage non-native, exotic species,
4. Protect rare and ecologically important species and unique or sensitive environments,
5. Maintain or mimic natural processes,
6. Protect genetic diversity,
7. Rehabilitate ecosystems, communities, and species; and
8. Monitor biodiversity impacts.

However, each of the management strategies described in this Plan should be monitored so that modifications can be made during implementation as conditions change.

Biodiversity is defined as "the variety of life and its processes" and can be defined on four basic levels: genetic diversity, species richness, ecosystem diversity, and landscape diversity. Genetic

diversity refers to the variation of genotypes within a species that influences different characteristics among individuals or populations. Species richness refers to the number of different kinds of species within a given area. Ecosystem diversity refers to the variety of ecosystems that interact across a large land area. Human communities are entirely and completely dependent on the goods and services provided by our diverse ecosystems. Decline of these ecosystems and the biodiversity within them is one of the foremost limitations to human prosperity. Ecosystem sustainability is the key to both biological diversity and human existence. It is the goal of this INRMP to successfully integrate ecological sustainability with goals and objectives that will sustain human communities and the operational mission of TRACEN Cape May. By protecting habitats that support the greatest variety of life, this INRMP helps perpetuate viable, sustainable populations of native species and communities.

The information presented in this INRMP will be incorporated into the TRACEN Cape May's Master Plan which is currently under review. The TRACEN Cape May comprehensive management planning process should incorporate the concerns presented in this INRMP so that the growth of the Installation can progress in a manner consistent with, and complementary to, the objectives of the USCG with regard to the protection of natural resources. Additionally, the INRMP's digital maps will be included as the TRACEN Master Plan's Tab A-1 (Natural and Cultural Resources) and Tab A-2 (Composite Natural Resources Constraints). Note that the cultural resources present on TRACEN Cape May are briefly discussed in Section 2.6 of this Plan.

1.1.1 Management Philosophy

The INRMP was developed using an interdisciplinary approach and information gathered from a variety of organizations. Information and guidance was also solicited from a variety of Federal, state, and local agencies and groups. An INRMP Focus Group was formed, which included key TRACEN personnel and individuals from various agencies and groups that have an interest in TRACEN Cape May and the management of its resources. Representatives from the following Federal, state, and local regulatory agencies and groups comprised the Focus Group: the U.S. Fish and Wildlife Service (FWS), New Jersey Department of Environmental Protection (NJDEP) Division of Fish and Wildlife, U.S. Department of Agriculture (USDA) – Natural Resources Conservation Service (NRCS), and the New Jersey Audubon Society. Coordination and correspondence with these agencies is documented and satisfies a portion of the requirements of preparation of the Environmental Assessment (EA) integrated into this INRMP.

The INRMP Focus Group ensured that information concerning the natural resources on or in the vicinity of the TRACEN was accurate and presented with acknowledgment to local and regional management strategies. As a result, the probable effects of TRACEN Cape May operations on the surrounding natural and cultural resources will be projected. This approach also allowed for insight into possible operational alternatives, which may result in reduced impacts to the natural resources on the TRACEN and in surrounding areas.

The INRMP presents practicable alternatives and recommendations that allow for the protection and enhancement of natural resources and conservation of existing ecosystems, while minimizing impacts to the TRACEN's mission(s). Consequently, the implementation of some of these recommendations will sacrifice improvement of the TRACEN's natural resources in deference to the safety and efficiency of the mission.

1.1.2 Authority

This INRMP is developed under, and proposes actions in accordance with, applicable DOT and USCG policies, directives, and instructions. COMDTINST M5090.3 provides the necessary direction and instructions for preparing a natural resources management plan. While this policy provides adequate guidance on the content and level of analysis in a natural resources management plan, there is no requirement for the cooperative preparation of this document with FWS and NJDEP Division of Fish and Wildlife Management. To strengthen the scope of this document, this INRMP has been prepared under the assumptions and regulations of the Sikes Act to ensure protection and enhancement of ecosystems, species, and critical habitats through a cooperative agreement with FWS and NJDEP Division of Fish and Wildlife Management.

1.1.3 Use and Organization of the plan

This INRMP is a “living” document, subject to periodic updates or changes, which integrates all aspects of natural resource management at TRACEN Cape May. Proper utilization of this Plan for the conservation of natural resources should not impair the ability of the TRACEN to perform its missions. This Plan has been written in accordance with all applicable USCG and DOT policies and instructions, and has been reviewed and approved by TRACEN Cape May Commander.

The USCG considers its goals and objectives with regard to the protection and enhancement of natural resources when planning projects and mission changes. Potential impacts are assessed, and possible alternatives that reduce negative impacts are explored. Applicable sections of this Plan are referenced when establishing new natural resource management strategies in response to changing missions or new projects.

For clarity of presentation, certain sections in this Plan have been reorganized from the format established in COMDTINST 5090, while continuing to maintain the intended objectives and to provide for integration of the EA. For example, commercial forestry opportunities are not present on TRACEN Cape May and are not discussed in this Plan.

This INRMP consists of seven sections that describe fundamental characteristics of the TRACEN. The location of TRACEN Cape May and its mission are described in Section 2. The environment of TRACEN Cape May affected by the implementation of this INRMP, including the physical environment, the biotic environment, and the mission impacts on the environment are described in Section 3. Resource management concerns specific to the TRACEN Cape May and the associated goals and objectives to resolve these concerns are presented in Section 4. Section 5 summarizes the natural resources management concerns and proposes a schedule for their resolution. Section 6 assesses the known, potential, and reasonably foreseeable environmental consequences related to implementing this INRMP and managing natural resources at TRACEN Cape May.

The list of preparers that were involved in the preparation of this INRMP and EA are presented in Section 7. The references used during the preparation of this INRMP are presented in Section 8. Acronyms, terms, and definitions of land management categories used in this INRMP are defined in Appendix A. The persons and agencies contacted during the preparation of this INRMP are listed in Appendix B. Environmental documentation prepared in support of this INRMP, such as correspondence with Federal and state natural resources agencies, is also presented in Appendix B. The Natural Resources Database of documents and regulatory resources is presented in Appendix C and on the inside cover of this document. In addition, a portion of the database has

been developed to index relevant plans, documents, COMDTINSTs, Commandant Publications (COMDTPUBs), and Federal, state, and local regulations that may be useful to TRACEN Cape May personnel. Appendix D provides plant and wildlife species information for TRACEN Cape May.

Appendices F through L are set aside as “space holders” for the inclusion of information in support of the Operational Component Plans that may be prepared to implement specific management goals and objectives for threatened and endangered species management, wetlands and floodplains management, watershed protection, fish and wildlife management, grounds maintenance and land management, outdoor recreation and public access, and geographical information systems at the TRACEN Cape May.

1.1.4 Approvals and Revisions

To ensure that this INRMP properly addresses all aspects of the natural resources present at TRACEN Cape May and proposes actions that are in accordance with USCG goals and objectives, this Plan and all its components have been coordinated by the TRACEN Cape May natural resources manager. Similarly, all changes to be incorporated into this Plan must be approved by the TRACEN Cape May natural resources manager.

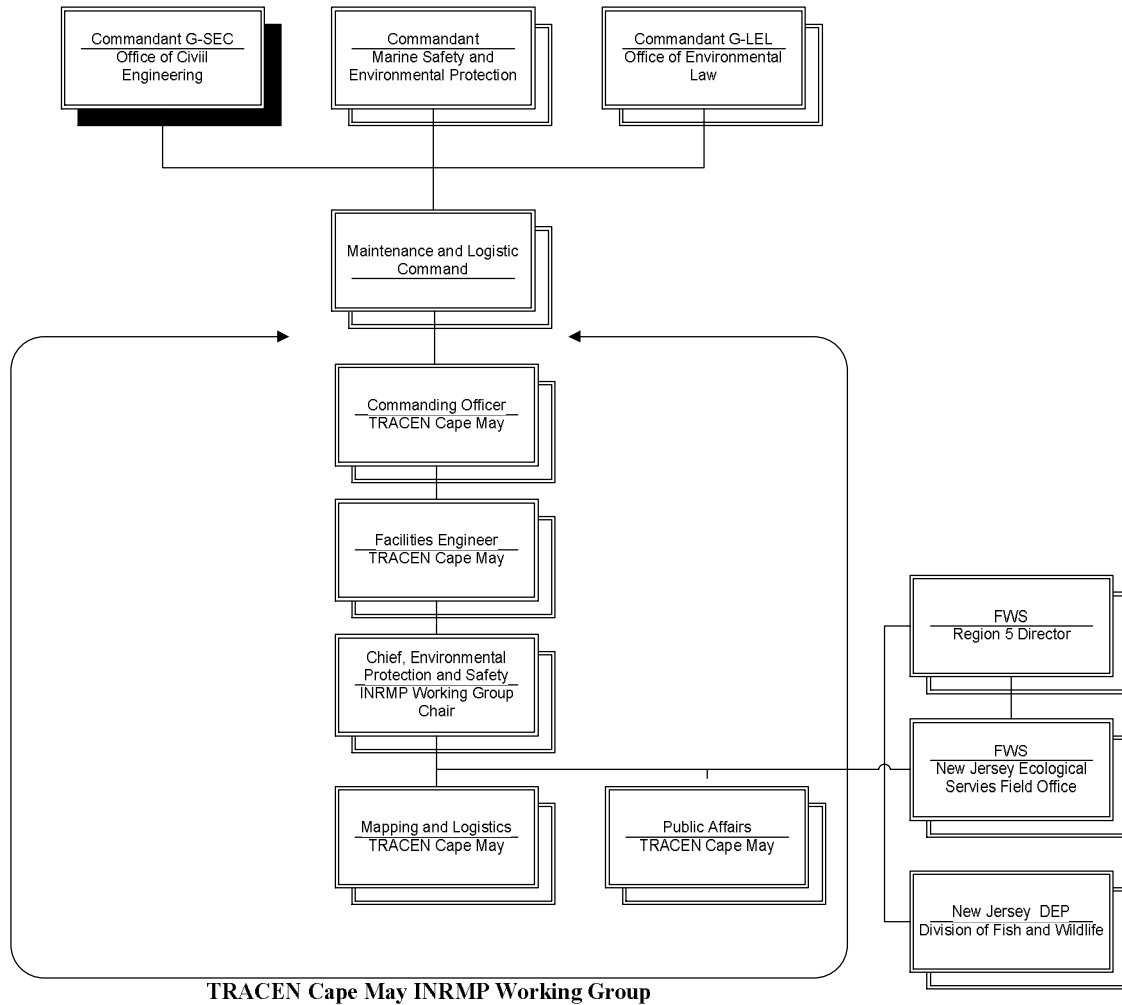
This INRMP is effective for five years from the date of approval; however, natural resources projects must be updated annually during preparation of the TRACEN Cape May environmental budgets. This Plan should be reviewed annually to assess the suggested management practices in terms of their appropriateness for current conditions at the TRACEN. Changes to be made in following revisions of the INRMP should be noted on the INRMP Update Form and logged into the Master INRMP Update Log. Both of these forms are located in Appendix M. In addition, the Plan should be updated whenever there is a modification to TRACEN Cape May’s mission, or there is a substantial change to the TRACEN’s natural or cultural resources.

1.2 INRMP IMPLEMENTATION AND RESPONSIBILITIES

This INRMP has been organized to ensure the implementation of year-round, cost-effective management activities and projects that meet the requirements of TRACEN Cape May’s mission. Various organizations on TRACEN Cape May that are responsible for the implementation of the INRMP are described in the following subsections. An organizational chart depicting the relationships between parties associated with the implementation of the INRMP is depicted in Figure 1-1.

1.2.1 Commandant, Office of Civil Engineering – (G-SEC)

The Office of Civil Engineering (G-SEC) works closely with TRACEN Cape May to plan, develop, promulgate, and update the procedures for the management of natural resources by TRACEN Cape May. Such activity includes the development and issuance of instructions, notices, and other directives to inform the USCG Maintenance and Logistics Command Atlantic (MLC LANT), Civil Engineering Unit (CEU), districts, and field units concerning Federal requirements and USCG policy. With this responsibility, TRACEN Cape May anticipates that G-SEC will serve as its point of contact for all new Federal natural resources management requirements such as threatened and endangered species listings, critical habitat designation, wetlands regulations, or landscaping requirements. This includes coordination every three years



1.2.2 Commandant Marine Safety and Environmental Protection (G-M)

The parties anticipate that USCG Commandant Marine Safety and Environmental Protection (G-M) will continue to cooperate with the TRACEN Cape May natural resources management efforts by making environmental sensitivity index maps available to unit personnel. Information will also be provided for units preparing facility response plans that identify and prioritize protection of specific locations.

It is also the responsibility of G-M to coordinate with TRACEN Cape May on the review of all natural resources management proposals by organizations and agencies external to the USCG which may impact USCG missions.

1.2.3 Commandant Office of Environmental Law (G-LEL)

The Coast Guard's Office of Environmental Law, Commandant (G-LEL), is responsible for providing counsel and representation concerning existing federal, state, and Coast Guard environmental requirements associated with implementation of the INRMP. In addition, as agency counsel, G-LEL is responsible for facilitating and coordinating any off-base legal disputes that may arise as a result of this INRMP.

1.2.4 Maintenance and Logistics Command

TRACEN Cape May will rely upon MLC to assist with the management and conservation of the soil, water, land, vegetation, grounds, fish and wildlife, wetlands, and floodplains. By acquiring the knowledge and training to remain up-to-date with Federal and state natural resources regulations, TRACEN Cape May anticipates that MLC will coordinate with its staff on proposals for new and continuing activities that affect natural resources. Coordination of natural resources management will be performed to seek the aid of Federal, state, and local agencies. Within these parameters, it is the responsibility of the MLC to report all incidents that involve listed species or critical habitat on the facility to the unit command and G-SEC.

The MLC also coordinates on a three years cycle with FWS or NMFS (either through the Environmental Compliance Evaluation (ECE) program or other programs) to identify potential habitat, or the occurrence of proposed or listed threatened or endangered species, or critical habitat within shore facilities of their responsible district.

The MLC also is responsible for advising units in the control of exotic and invasive species on TRACEN Cape May and also provides direction on general natural resources management actions and objectives of this INRMP. It is the goal of the MLC to ensure that this plan remains compliant with Federal, state, and local agency regulations.

1.2.5 INRMP Working Group

The INRMP Working Group will be responsible for the overall implementation of the INRMP at the Installation level. The INRMP Working Group will be made up of the key TRACEN Cape May personnel from the host unit and will assume an oversight role to ensure the effective implementation of this Plan. The Chief of Environmental Protection and Safety Section shall chair this organization and establish subcommittees to focus on high-level priority natural resources management issues, such as threatened and endangered species (see Section 4.3). Top and mid-level management representation, as well as representation from several individuals with

day-to-day on-Base field experience will provide the INRMP Working Group with the leadership and structure necessary for the successful implementation of this INRMP. Participation in the INRMP Working Group is subject to change based on the identification of additional natural resources issues or change in staff or TRACEN Cape May organization. Figure 1-1 depicts the current organization of the INRMP Working Group.

1.2.6 Commanding Officer—TRACEN Cape May

The Installation Commanding Officer is responsible to improve, preserve, and properly utilize the natural resources on TRACEN Cape May. In this capacity, the TRACEN Cape May Facilities Engineer under the delegated authority of the Commanding Officer will monitor, and direct unit compliance with natural resources issues to ensure implementation of the INRMP to the fullest extent practicable based on funding and manpower availability. The final approval of the INRMP and any future changes rests with the TRACEN Cape May Commander. The TRACEN Cape May Commanding Officer is directly responsible for the decisions of the INRMP working group, and attends and directs Working Group meetings in conjunction with the Working Group Chair.

1.2.7 USCG TRACEN Chief, Environmental Protection and Safety

The TRACEN Cape May Chief of Environmental Protection and Safety Section, in conjunction with the Public Affairs Office, is responsible for establishing and implementing a conservation education program to instruct Installation personnel on the protection and enhancement of biological diversity on TRACEN Cape May. The TRACEN Cape May Chief of Environmental Protection and Safety Section directs most of the ongoing natural resources management activities presented in this Plan. However, several management activities fall under the responsibilities listed for other Installation organizations. The TRACEN Cape May Chief of Environmental Protection and Safety Section will act as a technical point-of-contact for the activities they are not directly responsible for implementing. In this capacity, the Chief of Environmental Protection and Safety Section acts as the INRMP Working Group chair and directs the actions established in this INRMP in coordination with G-SEC. The Chief of Environmental Protection and Safety Section also ensures that all actions carried out by TRACEN Cape May are in compliance with applicable Federal, state, and USCG environmental law and regulations.

1.2.8 Other Organizations

The FWS and NJDEP – Division of Fish and Wildlife may provide technical assistance to TRACEN Cape May. Specifically, these agencies will alert the MLC, G-SEC, G-M, or the TRACEN Cape May Chief, Environmental Protection and Safety whenever new species that have the potential for inhabiting the Base are added to the Federal or state endangered species lists. In addition, these agencies should support the TRACEN personnel during scheduled wildlife and vegetation surveys. The cooperative agreement was established through the cooperative process of preparing this INRMP.

1.3 NEPA COMPLIANCE AND INTEGRATION

1.3.1 National Environmental Policy Act of 1969

The National Environmental Policy Act, commonly known as NEPA, is a Federal statute requiring the identification and analysis of potential environmental impacts of proposed Federal actions before those actions are taken. NEPA established the Council on Environmental Quality (CEQ) that is charged with the development of implementing regulations and ensuring Federal agency compliance with NEPA. CEQ regulations mandate that all Federal agencies use a systematic interdisciplinary approach to environmental planning and the evaluation of actions that may affect the environment. This process evaluates potential environmental consequences associated with a Proposed Action and considers alternative courses of action. The intent of NEPA is to protect, restore, or enhance the environment through well-informed Federal decisions.

The process for implementing NEPA is codified in 40 Code of Federal Regulations (CFR) 1500-1508, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*. The CEQ was established under NEPA to implement and oversee Federal policy in this process. To this end, the CEQ regulations specify that an Environmental Assessment (EA) be prepared to:

- Briefly provide evidence and analysis for determining whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI);
- Aid in an agency's compliance with NEPA when an EIS is unnecessary; and
- Facilitate preparation of an EIS when one is necessary.

USCG's implementing regulation for NEPA is DOT Order 5610.1C, *Procedures for Considering Environmental Impacts*. DOT Order 5610.1C sets the policy and procedures that supplement the CEQ regulations and applies them to DOT programs. USCG complies with CEQ regulations and the provisions of the DOT Order through COMDTINST M16475.1D.

1.3.2 INRMP and NEPA Integration

To comply with NEPA, the planning and decision-making process for actions proposed by Federal agencies involves a study of other relevant environmental statutes and regulations. The NEPA process, however, does not replace procedural or substantive requirements of other environmental statutes and regulations. It addresses them collectively in the form of an EA or EIS, which enables the decision-maker to have a comprehensive view of major environmental issues and requirements associated with the Proposed Action. According to CEQ regulations, the requirements of NEPA must be integrated "with other planning and environmental review procedures required by law or by agency so that all such procedures run concurrently rather than consecutively." The adoption of an INRMP can be considered a major Federal action as defined by Section 1508.18 of the CEQ regulations. As such, implementation of projects identified in the Plan may require consideration of potential environmental effects as described in DOT Order 5610.1C. For the purposes of implementing the TRACEN Cape May INRMP, an EA has been chosen as the appropriate level of NEPA analysis, and has been integrated as part of the INRMP. Table 1-1 presents a "roadmap" of the NEPA analysis incorporated as part of this INRMP by providing the INRMP sections that correspond to the sections typically found in an EA.

Table 1-1. Roadmap Indicating NEPA Analysis and Corresponding INRMP Sections

Required NEPA Analysis	Corresponding INRMP Section
Executive Summary – briefly describes the Proposed Action, environmental consequences, and mitigation measures.	Executive Summary
Purpose of and Need for the Proposed Action – summarizes the Proposed Action’s purpose and need and describes the scope of the environmental impact analysis process.	Section 1.3.3
Description of the Proposed Action and Alternatives – describes the Proposed Action of implementing the INRMP and alternatives to the implementation of the Proposed Action.	Sections 1.3.4, 4.0, and 5.0
Scope of Analysis – describes the scope of the environmental impact analysis process.	Section 1.3.6
Affected Environment – describes the biotic environment and the general physical environment potentially affected by the Proposed Action within the scope.	Section 3.0
Environmental Consequences – identifies the potential environmental impacts of implementing the INRMP.	Section 6.0
Cumulative Effects – identifies potential impacts associated with the alternatives and draws a recommendation as to which alternative should be implemented.	Section 6.3
List of Preparers – identifies persons who prepared the document and their areas of expertise and training.	Section 7.0
References – provides a list of sources utilized in the preparation of the EA and INRMP.	Section 8.0
Persons Consulted – provides a list of persons and agencies consulted during the preparation and approval of the EA.	Appendix B
Distribution List – indicates recipients of the EA.	Appendix B
Agency Consultation Letters – copies of these letters and supplemental information used in the preparation of the EA.	Appendix B

1.3.3 Purpose of and Need for the Plan

USCG is proposing to implement this INRMP at TRACEN Cape May, New Jersey, which supports the management of natural resources as prescribed by the Plan itself. The purpose of the Proposed Action is to carry out the set of resource-specific recommended management strategies developed in the INRMP, which would enable USCG to manage effectively the use and condition of natural resources located on the Installation. Implementation of the Proposed Action would support USCG’s need to provide realistic training for personnel while meeting mission requirements and complying with environmental regulations and policies.

1.3.4 Description of the Proposed Action and Alternatives

Proposed Action

USCG proposes to implement this INRMP, which supports the management of natural resources as described by the Plan itself. The purpose of the Proposed Action is to carry out the set of resource-specific management measures developed in the INRMP. This would enable TRACEN Cape May personnel to protect the natural setting by effectively managing the use and condition of natural resources located on the Installation. Implementation of the Proposed Action would support USCG's continuing need to ensure the safety and efficiency of TRACEN Cape May personnel while practicing sound resource stewardship on the Installation and complying with environmental policies and regulations.

The Proposed Action supports an ecosystem approach and includes natural resource management measures to be undertaken at TRACEN Cape May, New Jersey. The Proposed Action focuses on a 5-year planning period, which is consistent with the timeframe for the management measures described in the INRMP. This planning period would begin in Fiscal Year (FY) 2003 and end in FY 2007. Additional environmental analysis may be required as new management measures are developed over the long-term (i.e., beyond 5 years).

Alternatives

The development of proposed management measures for the INRMP included a screening analysis of resource-specific alternatives. The screening analysis involved the use of accepted criteria, regulations, guidelines, and best professional judgment to identify management practices for achieving TRACEN Cape May natural resource management objectives. The outcome of the screening analysis led to the development of the Proposed Action as described above. Consistent with the intent of NEPA, this screening process focused on identifying a range of reasonable resource-specific management alternatives and, from that, developing a plan that could be implemented, as a whole, in the foreseeable future. Management alternatives deemed to be infeasible were not analyzed further. As a result of this screening process, this EA, which has been included as integral part of this INRMP, formally addresses two alternatives: the Proposed Action (i.e., implementation of the INRMP) and the No Action Alternative.

No Action Alternative

Implementation of the No Action Alternative would mean that the proposed management measures set forth in the INRMP would not be implemented. Current management measures for natural resources would remain in effect and existing conditions would continue. This document refers to the continuation of existing (i.e., baseline) conditions of the affected environment, with out implementation of the Proposed Action, as the No Action Alternative. The No Action Alternative serves as a benchmark against which Federal actions can be evaluated. Inclusion of a No Action Alternative is prescribed by CEQ regulations and, therefore, will be carried forward for further analysis in this EA.

1.3.5 Public Involvement

Interagency participation is invited throughout the process for developing this INRMP. It is used as a tool to inform decision makers and the public of the likely environmental and socioeconomic consequences of implementing the Proposed Action and the No Action Alternative. In addition, USCG provides for public participation in the NEPA process to promote open communication

and better decision-making. Public participation is invited throughout the NEPA process in the development of this INRMP.

An interdisciplinary approach is being used to develop the Plan. Information and guidance will be solicited from a variety of Federal, State, and local agencies and groups. An INRMP Focus Group has been formed and is made up of key Installation personnel and individuals from various agencies and groups that have an interest in TRACEN Cape May and the management of its natural resources. State and Federal agency members of this Focus Group represent the FWS, the U.S. Army Corps of Engineers (USACE), the USDA, and the New Jersey Audubon Society. This Focus Group will ensure that information concerning the natural resources on or in the vicinity of the Installation is accurately accounted for and is managed in a way that is compatible with local and regional management strategies.

A formal agency consultation letter has been mailed to individuals on the Focus Group and a TRACEN Cape May INRMP Focus Group meeting has been held. A listing of the persons consulted in the preparation of the INRMP and copies of all agency correspondence will be included in the Final INRMP.

The public and concerned organizations, including minority and low-income, disadvantaged, and Native American groups, will be notified of the findings and conclusions of this INRMP (with incorporated EA) by an announcement of the availability of a FONSI in the local newspapers and by the availability of this INRMP for public review for 30 days before TRACEN Cape May initiates the Proposed Action. The availability of the FONSI and the INRMP will be published in the local newspapers (i.e. Cape May Star and Wave,) and the documents will be made available for public review at the Cape May County Library - 4 Moore Road, Cape May Court House, NJ 08210 and at TRACEN Cape May – 1 Munro Avenue, Cape May, NJ 08204.

1.3.6 Scope of Analysis

The potential environmental effects associated with the Proposed Action are required to be assessed in compliance with NEPA, Regulations of CEQ, COMDTINST M16475.1D, and DOT Order 5610.1C. This EA identifies, documents, and evaluates the effects of implementing the INRMP for USCG. The INRMP addresses the geographical area associated with TRACEN Cape May. As discussed, this EA examines USCG's preferred alternative (i.e., the Proposed Action as described in Section 1.3.5) and the No Action Alternative (see Section 1.3.5). The document analyzes potential environmental effects associated with implementation of the Proposed Action and the No Action Alternative. Mitigation measures are also identified, where appropriate. The potential effects associated with the Proposed Action and No Action Alternatives are discussed in Section 6.0.

The objective of this document is to provide an implementable INRMP for USCG that guides the Installation in the following activities:

- Meeting training needs and mission requirements;
- Achieving natural resource management goals consistent with an ecosystems approach to management; and,
- Meeting legal and policy requirements, including those associated with NEPA, which are consistent with current natural resource management philosophies.

In order to meet this objective, an interdisciplinary team of environmental scientists, biologists, planners, archeologists, and technicians developed the EA. The team identified the affected environment, analyzed the Proposed Action against existing conditions, and determined the potential beneficial and adverse effects associated with both the Proposed Action and No Action Alternative.

2. TRACEN LOCATION AND MISSION

Current and historic information pertaining to land uses at TRACEN Cape May and in surrounding communities is necessary to properly manage natural and cultural resources and assess future management activities. This section describes the location of TRACEN Cape May and the surrounding community as well as describing the natural and cultural resources associated with the area. A brief history of the TRACEN and its current mission are also presented.

2.1 LOCATION AND SURROUNDING AREA

TRACEN Cape May is located at the southern tip of Cape May County, New Jersey. The Installation is located on the eastern side of the peninsula known as Sewell Point that is formed by Cape May Harbor and the Atlantic Ocean. The Installation comprises approximately 300 acres of land managed by USCG (TRACEN 1997). As shown in Figure 2-1, TRACEN Cape May is at the southern tip of the Cape May Peninsula which is ideally situated as a "jumping-off" point for migratory birds during spring and fall migrations. This geographical advantage combined with a large network of wetlands, mudflats, and beaches provide exceptional habitat for migrating birds. Due to the high concentrations of birds and the excellent beaches of the Delaware Sound, this area supports an ecotourism industry which drives much of the commercial and residential land use of the region.

The Installation is approximately 90 miles southeast of Philadelphia, PA and approximately 120 miles south of Trenton, New Jersey. The Garden State Parkway, Route 9, and the Atlantic City Expressway provide highway access to Cape May County from the surrounding areas. TRACEN Cape May can be accessed from Pennsylvania Avenue, via New Jersey Route 109. Visitors entering TRACEN are welcomed at the manned front gate. Several smaller roads surround the TRACEN Cape May area. These are two-lane improved, all-weather hard-surfaced roads (see Figure 2-1).

2.2 INSTALLATION HISTORY

Sewell Point, the area occupied by TRACEN Cape May, has a long history of naval presence prior to USCG ownership. During the American Revolution and throughout the nineteenth century, Cape May Sound was used as a harbor of refuge. In 1917, the Navy established a "section base" in Cape May, to provide training, vessel support, and communication facilities for coastal defense. Initially, the Navy converted an abandoned amusement center, built along the oceanfront, into facilities for military use. The old skating rink became the mess hall and sleeping quarters, the stage was made into a galley, the "human roulette wheel" was converted into a scrub table, and the "barrel of fun" became a brig. When these old wooden structure burned down in 1918, the Navy built standard military facilities along the harbor front (some of these buildings still stand today) (TRACEN undated a, TRACEN 2001)

After World War I, the base was adapted to accommodate dirigibles. At this time, Sewell Point cited the largest hanger in the world, 700 feet long and over 100 feet tall, built to accommodate an airship under construction in Britain. Unfortunately, the ZR-2 airship crashed on its test flight in Great Britain and "lighter-than-air" craft were never fully adopted for Navy use (TRACEN undated a, TRACEN 2001). All hangers were subsequently demolished.



Figure 2-1. TRACEN Cape May Location Map

The USCG had later established air facilities for planes used in coastal patrols and in support of the Customs Department in 1924. This strip remained in use until February 1941 when more acreage was created from dredged fill and a larger airstrip was constructed. The new strip served as a training base for Navy aircraft carrier pilots. During the Prohibition era, several cutters were assigned to Cape May to foil rumrunners operating off the New Jersey coast. After Prohibition, the USCG all but abandoned Cape May with the exception of a small air/sea rescue contingent. For a short period of time (1929-1934), part of the base was used as a civilian airport. With the advent of World War II, and construction of the larger airstrip was constructed and the Navy returned to Cape May to train aircraft carrier pilots. The over-the-water approach simulated carrier landings at sea. The USCG also increased its Cape May forces for coastal patrol, anti-submarine warfare, air/sea rescue, and buoy service. In 1946, the Navy relinquished the base to the USCG (TRACEN undated a, TRACEN 2001).

On May 31, 1948, the USCG TRACEN was established at Cape May, moving all East Coast recruit training facilities from Mayport, Florida. TRACEN Cape May has been the only basic training center in the USCG since the closure of the recruit training center in Alameda, California in the early 1980's (TRACEN 2001). The long history of intensive land use and varied land owners on Sewell Point has resulted in many different footprints at what is now TRACEN Cape May. Figure 2-2 depicts the footprint of the Installation in 1954 shortly after commissioning as USCG TRACEN. The majority of the buildings and the airstrip have been demolished as shown in Figure 2-3. Although most of the original Naval Base buildings have been replaced with modern training facilities, the USCG is respectful of the history of Sewell Point, with TRACEN Cape May fulfilling its mission for over fifty years (TRACEN undated a). As seen in the two photographs, substantial land modifications have occurred on the site over 100 years of intensive recreational and government utilization.



Source: Siegel 2002

Figure 2-2. 1954 Aerial Photo of TRACEN Cape May



Source: United States Geological Survey (USGS) 1991

Figure 2-3. 1991 Aerial Photograph of TRACEN Cape May

2.3 CURRENT OPERATIONAL MISSIONS

The mission of the TRACEN Cape May is to “build the enlisted corps by preparing America’s volunteer for success in the Coast Guard. We provide apprentices who are willing and ready to learn their profession. We enhance the quality of life and readiness of those we serve.” (TRACEN 2001). TRACEN Cape May hosts other resident training programs in addition to recruit training. The Reserve Enlisted Basic Indoctrination training program is designed to introduce incoming reservists, new to the USCG, to the customs, courtesies, and operations of the USCG. The Company Commander School trains the petty officers and chief petty officers that train the recruits. All enlisted personnel assigned to TRACEN Cape May as Company Commander, Section Commander, and Battalion Commander must attend the Company Commander School. The Recruiter School has a mission to enable Recruiters to more effectively recruit: that is, to reach out into a given community and encourage the best prospective USCG members to join, not to simply be content with or rely upon only those individuals who seek out the Recruiter. This four week course is required for all personnel assigned to duty as a Recruiter or Recruiter in Charge.

TRACEN Cape May is also home to many tenant activities and provides support services to these training activities, including family housing, medical services, logistical support, dining facilities, athletic facilities, and the USCG Exchange (TRACEN 1997). Smaller boats are operated by Station Cape May that are used to patrol the coast around Cape May. This tenant also provides a local SAR function, maintains communications and coastal patrols, and assists with law enforcement activities. The Aids to Navigation Team (ANT) maintains and repairs navigation aids including buoys and lighthouses. Along with these tenant activities, TRACEN is also the

home port for five USCG cutters that perform SAR duties, fisheries enforcement, and drug enforcement interdiction (TRACEN 1997).

The USCG has been entrusted with the use and management of lands and waters throughout the United States as a Federal agency. An important factor in these responsibilities is ensuring that USCG actions and activities are conducted in an environmentally sound manner and in compliance with all applicable Federal, state, and local regulations, in accordance with USCG policy COMDTINST M5090.3 and COMDTINST M16475.1D.

2.4 LAND USE

Current and historic information pertaining to land uses on the TRACEN and in the surrounding communities is necessary to properly manage natural resources and assess future management activities. This section describes land uses associated with the surrounding community, as well as with TRACEN Cape May.

2.4.1 Surrounding Land Use

The Cape May peninsula has a rich history of alternate land uses. Many of the undeveloped areas in the region are state Wildlife Management Areas (WMA) and uninhabited protected natural areas. In the early 20th century, surrounding areas had been disturbed by diking, dredging, and filling due to development and urban land use. The mid-20th century brought renewal to the area, in the form of tourism. Each year, tourists are attracted to beaches and natural areas of the southern New Jersey coastline (City of Cape May 2002). Tourism remains a primarily seasonal attraction in the region with visitation pressure dropping significantly in the winter off-season.

The proximity of New Jersey's coast to the New York and Philadelphia metropolitan areas has contributed to its growth. During 1999, travel and tourism in six coastal counties (Atlantic, Cape May, Cumberland, Monmouth, Ocean and Salem) generated over \$14.65 billion in revenue and were responsible for 384,500 tourism-related jobs which have a payroll of approximately \$8 billion. Marine related activities played an important role in tourism during the 1999 season as well. The popularity of ecotourism and the number of opportune destinations (WMAs, shallow estuarine areas, extensive marshes, and shorebird viewing areas) over the past decade has contributed substantially to the growth of the tourism industry in New Jersey (NJDEP 2001c).

As shown in Figure 2-4, marshes and residential areas also cover a large portion of the peninsula. These areas are interspersed with other land uses such as recreational and commercial areas, coniferous and deciduous forests, and open waters. Agricultural areas also cover a large area of the peninsula and are often used for cattle grazing. Beaches are found along the Atlantic Coast and dunes border the beaches on the western side of the peninsula.

The land that is located to the north of Cape May Harbor (to the north and east of TRACEN Cape May) is primarily covered with marshlands. TRACEN Cape May is bordered on the north and east by Cape May Harbor and on the south by the Atlantic Ocean. Most of the western portion of the Installation is bordered by the residential areas of the city of Cape May.

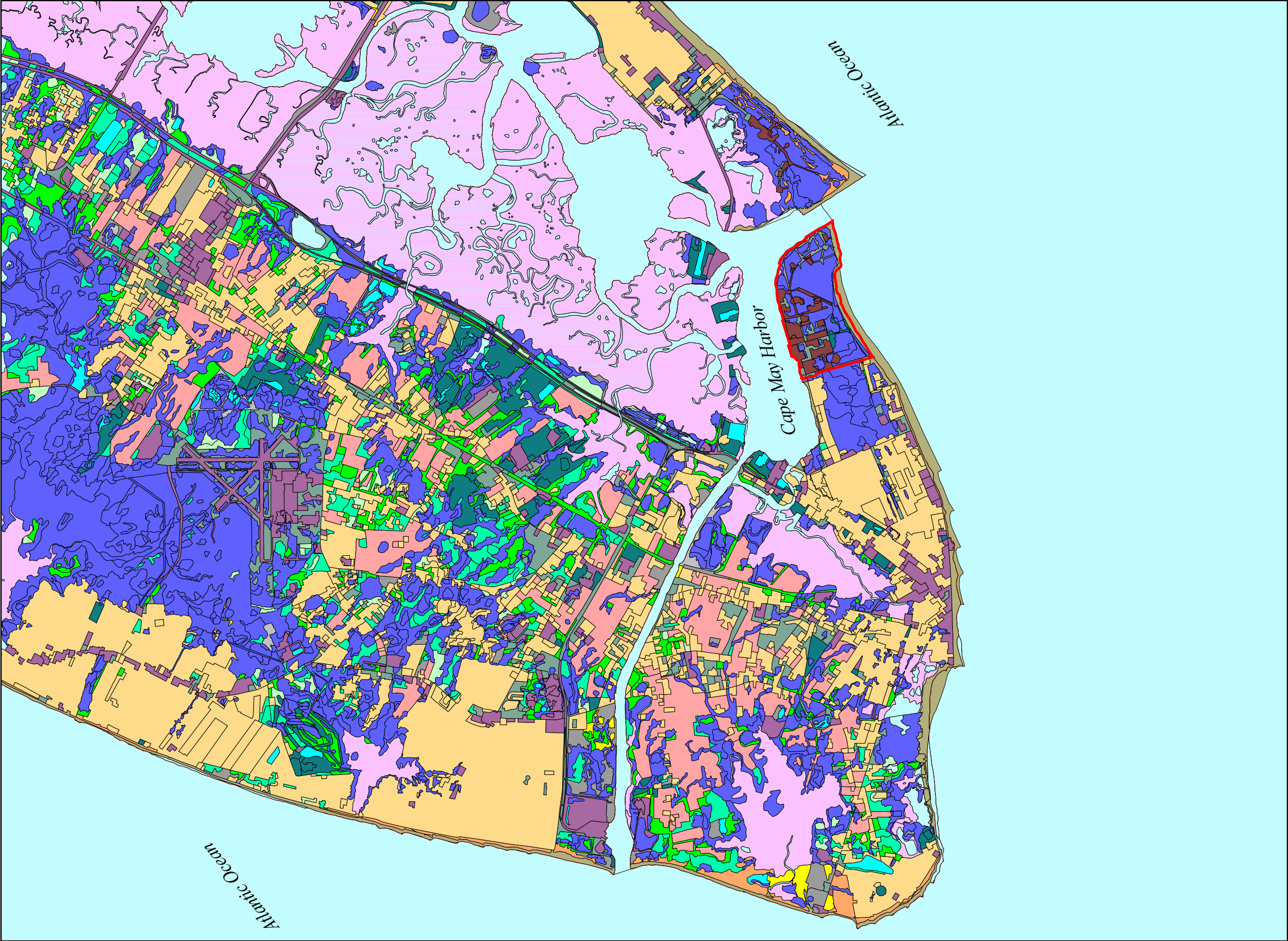
2.4.2 TRACEN Cape May Land Use

TRACEN Cape May covers 300 acres, which are predominantly managed to support the mission of the USCG and the DOT while protecting ecosystem functionality and structure to the highest

degree possible. In order to apply the ecosystem management approach used in this INRMP, the Installation has been broken up into several Land Use Management Units (LMUs) to better understand the dynamics between the Installation land uses and the surrounding environment. Table 2-1 provides a brief description of the LMUs used to manage the land uses of TRACEN Cape May. These LMUs are graphically displayed in Figure 2-5.

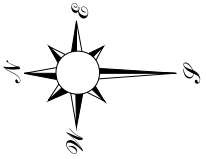
**Table 2-1. Brief Description of the Land Use Management Units
Found on TRACEN Cape May**

Land Use Management Unit	Brief Description	Approximate Acreage
Open Space	Most of the open areas on TRACEN Cape May are comprised of semi-improved mowed areas with approximately 27 acres of wetlands. The majority of the wetlands are inundated with common reed (<i>Phragmites australis</i>).	104 acres
Improved Areas	Most of the improved areas are located in the north-central area at TRACEN Cape May.	61 acres
Forested Areas	The majority of the forested areas are scattered throughout TRACEN Cape May, but a large portion of the eastern side of the Installation is forested area. Forested areas are defined as areas that have a closed canopy of trees or woody shrub species.	46 acres
Outdoor Recreational Areas	Much of the Outdoor Recreation LMU is located in the southwestern side of the Installation and used for recreational activities and recruit training.	27 acres
Sensitive Species	The beaches along the southern boundary of the Installation are designated nesting areas for piping plover (<i>Charadrius melodus</i>) and least tern (<i>Sterna antillarum</i>). These areas extend to the foot of the dunes located behind the beaches and are managed as a distinct LMU under the instruction of TRACENCMISNT 16450 – <i>Endangered Species Management Plan</i> .	11 acres
Residential Areas	The Residential LMU is located on the southwest edge of TRACEN Cape May and is comprised of several residential one-story units.	1.2 acres
Roads/Impervious Surfaces	These include sidewalks, roads, impervious surfaces, and buildings that must be constantly maintained.	47 acres



LEGEND

- TRACEN Cape May Outline
- | | | |
|-------------------|-------------------|--------------|
| Agriculture | Dune | Old Field |
| Barren Land | Extractive Mining | Open Water |
| Beaches | Government | Recreational |
| Commercial | Marsh | Residential |
| Coniferous Forest | Mixed Forest | Urban |
| Deciduous Forest | Ocean | Wetlands |



0.5 0 1 2 Miles

Figure 2-4. Regional Land Use
in the Vicinity of
TRACEN Cape May

Approximately twenty-seven acres of the Installation is wetlands. Ecological communities designated within the buffer region include: wetlands, coastal sand dunes, coastal beaches, open grassy areas, and improved and semi-improved grounds areas (TRACEN 1997). These areas are managed as part of the Open Space LMU when considering land use because of the relatively low ecological value of these wetlands.

Although TRACEN Cape May was established in 1948, most of the buildings and the landscape of the Installation have been significantly modified. Most of semi- and un-improved land use areas at TRACEN Cape May consist of open spaces. However, a large part of the Installation is improved and is comprised of roads, impervious surfaces, and buildings. The central area of TRACEN Cape May consists of approximately 90 buildings that include office buildings, classrooms, barracks, warehouses, maintenance shops, bunkers, dining halls, restaurants, stores, a dispensary, a gymnasium, a fire station, and a daycare center (TRACEN 1997).

There is a large outdoor recreation area in the southwest portion of the Installation that contains a running track, soccer field, tennis courts, two ball fields, and an enclosed picnic area. The residential areas on TRACEN are located on the western edge of the Installation, which is bordered by forested areas. This area is managed as the Outdoor Recreation LMU.

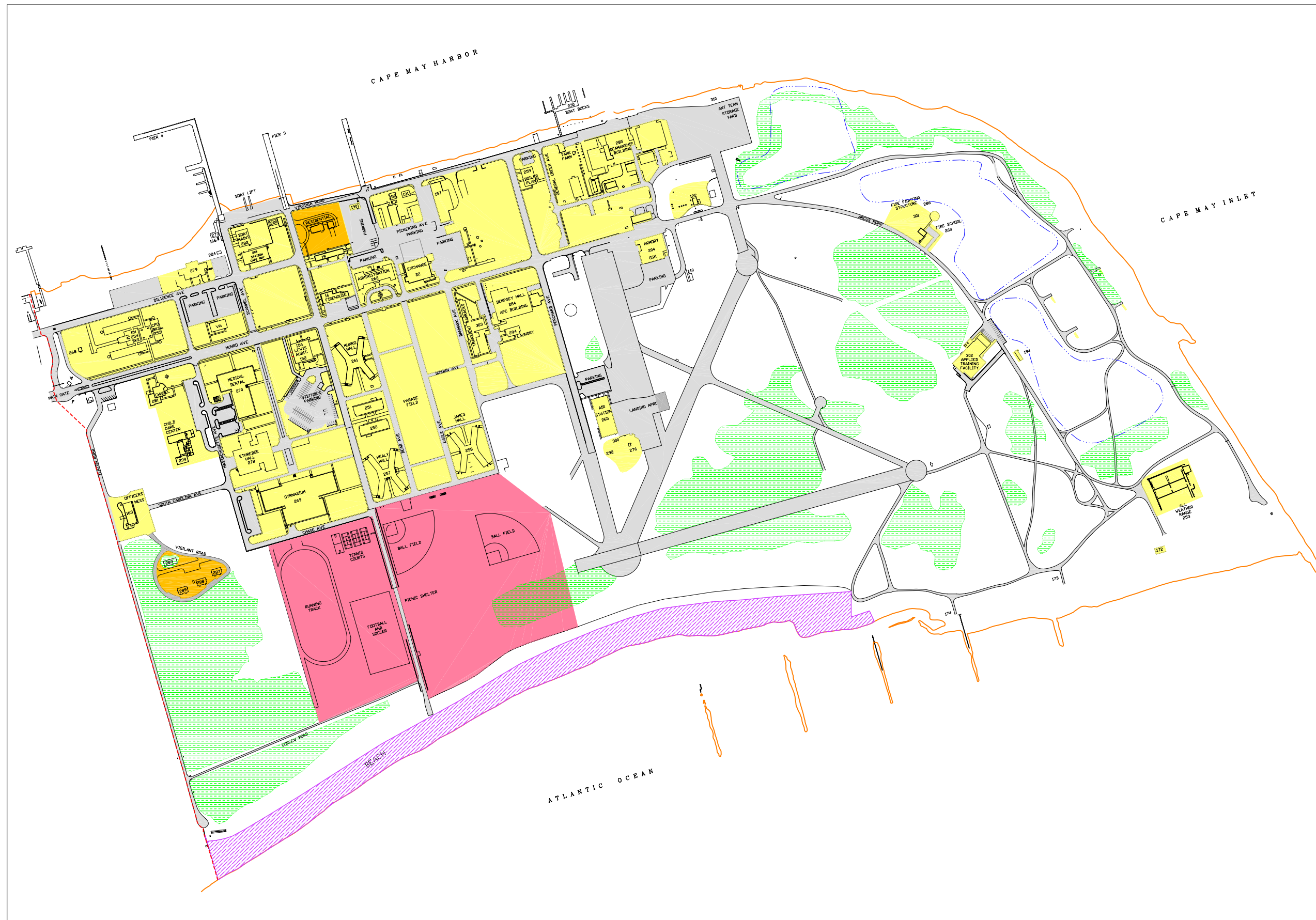
Sensitive species areas within the beaches and dunes lie on the southern boundary of the Installation where it meets the Atlantic Ocean. There is also a small marsh area on the northeastern edge of TRACEN, along Cape May Harbor. Specific information on the Sensitive Species LMU is included in Section 3 of this INRMP.

The USCG limits traffic to TRACEN by use of the main gate at the entrance of the facility, accessed via the primary access road. The system of internal roads is maintained within the Installation to provide access during fire emergencies and TRACEN activities. These paved roads are primarily passable by most vehicles. Figure 2-6, the detail map of the Installation, depicts the internal road network within the TRACEN.

Land use at TRACEN is managed to meet the needs of the TRACEN Cape May mission. Many land modification activities must be permitted through USCG, NJDEP, and NEPA requirements. Specific natural resources management actions of this INRMP often refer back to these LMUs due to the utility of the generalized land uses when considering the Installation from a landscape ecology perspective. These LMUs have been selected based on the manner in which they will be considered during analysis of ecosystem structure of the region. There is limitation in use of this perspective due to the lack of power that USCG has in accessing parts of the greater ecosystem not under their ownership. Therefore, the generalization of the LMU provides a structure by which rough comparisons can be made to the land uses of the surrounding areas.

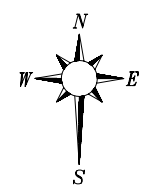
2.4.3 Proximity of TRACEN Cape May to Local Natural Areas

Bordered by the Atlantic Ocean on the east, the Delaware Bay on the west, and the Tuckahoe River to the north, the Cape May peninsula is one of the most important natural areas in the world for migratory birds. To protect this important natural heritage, several areas of the Cape May peninsula have been designated as bird refuges, sanctuaries, National Wildlife Refuges, New Jersey State WMAs, and observatories (Cape May County Department of Tourism 1999).



LEGEND

- Base Boundary
- High-Tide Line
- Dredge Spoil Areas
- TRACEN Detail
- Land Management Units:
 - Forested
 - Improved Areas
 - Residential Areas
 - Roads/Impervious Surfaces
 - Outdoor/Recreation
 - Sensitive Species
 - Open Spaces



400 300 200 100 0 100
SCALE IN FEET

**Figure 2-5. TRACEN Cape May
Land Management Units**

In an effort to conserve and protect the areas that are important for the continued success of migratory bird species, a large portion of the habitat in Cape May County is protected by the State of New Jersey WMAs. The WMAs within Cape May County include almost 58,000 acres. The two primary WMAs are Peaslee WMA which is 22,276 acres that extends through Cape May and Cumberland Counties and Tuckahoe WMA which is 14,108 acres of Cape May and Atlantic Counties (NJDFW 2002). A summary of the WMAs in Cape May County, New Jersey is presented in Table 2-2.

Table 2-2. Cape May County, New Jersey Wildlife Management Areas Acreage

Wildlife Management Area	Acreage
Beaver Swamp	2,945
Cape Island	162
Cape May Wetlands	12,346
Dennis Creek	5,649
Higbee Beach	1,003
Lizard Tail Swamp Preserve	378
Spicers Creek Access	17
Tuckahoe (MacNamara)	14,108
Peaslee	22,276
TOTAL ACREAGE	58,888

Other natural areas within the area include the Cape May Nature Center and the Cape May Bird Observatory. The Cape May Nature Center, which is located in Cape May Harbor, is managed with assistance by the New Jersey Audubon Society, Clean Ocean Action, and Rutgers Cooperative Extension Service. The Nature Center, located just southwest of TRACEN, offers access to beach and marsh habitat, offers workshops, classes, walking tours, and exhibits to the public (Cape May County Department of Tourism 1999). The Cape May Bird Observatory is managed by the New Jersey Audubon Society and is a leader in research, environmental education, bird conservation, and recreational birding activities. Cape May Bird Observatory's mission is to understand and instill appreciation of the needs of resident and migrating birds so that human ambitions do not undermine them.

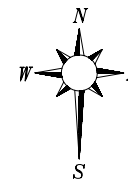
2.5 SUMMARY OF THE CULTURAL RESOURCES PRESENT ON TRACEN CAPE MAY

Cultural resources consist of prehistoric and historic sites, districts, structures, artifacts and any other physical evidence of human activities considered important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. The National Historic Preservation Act (NHPA), as amended in 1992 (16 U.S.C. et seq.) and NEPA require the consideration of impacts on cultural resources either listed or eligible to be listed on the National Register of Historic Places (NRHP). Cultural resources can be divided into three major categories:



LEGEND

- Base Boundary
- █ Buildings
- High-Tide Line
- - - Dredge Spoil Areas
- TRACEN Detail



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SCALE IN FEET

**Figure 2-6. Detail Base Map
of TRACEN Cape May**

- Traditional cultural properties
- Archeological resources
- Architectural resources

2.5.1 Known Cultural Resources

Traditional Cultural Properties

Traditional cultural properties can include archeological resources, buildings, neighborhoods, prominent topographic features, plants, animals, and minerals that Native American or other ethnic groups consider essential for the persistence of their traditional culture. Resources generally must be greater than 50 years old to be considered for protection under existing cultural resource legislation. The significance of traditional cultural properties is often determined through consultation with the groups that are associated with the sites. There are no known traditional cultural properties at TRACEN Cape May.

Archeological Resources

Prehistoric site types that may be found at or near TRACEN Cape May may include fishing stations, shellfish middens, ceramic scatters, burials, lithic scatters, campsites, and villages. There have been limited archeological investigations in southern New Jersey. However, evidence of habitation dating back almost 12,000 years has been discovered in the area. During this time, changes in subsistence and settlement have altered from overhunting and commercial farming practices. A number of archeological sites have been recorded in Cape May County where most of the research has focused on the Pinelands (Bennett 2002). Research in historical archeology has focused on more famous sites in the north, such as Trenton. A 1994 study conducted by the USACE concluded that, due to previous high levels of ground disturbance, TRACEN Cape May is not likely to contain archeological resources that retain integrity (Dames and Moore 1994).

Architectural Resources

The town of Cape May is listed on the NRHP and designated a National Historic Landmark. It contains over 600 wooden Victorian structures dating between 1850 and 1910. The 1994 USACE study concluded that TRACEN Cape May contains no buildings or structures that are currently eligible for the NRHP.

2.5.2 Unknown Cultural Resources

The potential for the inadvertent discovery of archeological resources during ground disturbing activities always exists. Certain areas have a higher potential to yield archeological resources (i.e. stream banks and bottoms) than others (i.e. steep slopes). The USCG ensures that, in the event of the inadvertent discovery of archeological resources, measures are taken to promptly protect the find from disturbance, assess the significance of the discovery, and implement appropriate mitigative measures for significant resources.

If human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered, USCG shall ensure that all appropriate measures are implemented to protect remains and any other protected cultural items. All appropriate tribes and agencies will be promptly notified of the find, and all applicable federal, tribal, and state procedures followed.

In the future, if any undertakings that may alter a building or structure that is fifty years old or older are planned, the USCG shall evaluate them for eligibility for listing on the NRHP. If the building or structure is deemed eligible, the Section 106 process will be implemented, the effects of the undertaking must be assessed and, if necessary, mitigated.

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3. AFFECTED ENVIRONMENT

3.1 GENERAL PHYSICAL ENVIRONMENT

This section describes the general physical environment of TRACEN Cape May, including climate, grounds categories (i.e., distribution of land), topography, geology, and soils, as well as the TRACEN Cape May's coastal management zones.

3.1.1 Climate

The climate of the Cape May peninsula is strongly influenced by variable summer and winter temperatures and large daily temperature fluctuations. The daily temperatures for the year range from an average low of 48°F to an average maximum of 61°F. During the winter (normally in the months of January and February), the soils will freeze for short periods of time. The average frost-free period lasts approximately 180 days between mid-April to early November for the area with an average of 10 days each year having at least 1 inch of snow on the ground. However, the number of such days varies from year to year (Dames and Moore 1993, Dames and Moore 1994, USDA-NRCS 2000).

The Cape May peninsula experiences a typically mild maritime climate with an average 47.6 inches of precipitation being distributed throughout the year, with a slightly greater amount being delivered as rainfall between April and September. The average snowfall for the area is approximately 14.2 inches each year. There is only a small water deficit that is incurred during the summer months and a large surplus develops during the spring (Dames and Moore 1993, Dames and Moore 1994).

Approximately 1.27 coastal storms occur per year, which increase tide levels and cover much of the barrier island zone with flood waters. During coastal storms, strong winds may damage unprotected plants and remove organic matter from the already low organic content soils. Thunderstorms occur on an average of 27 days each year (Dames and Moore 1993, Dames and Moore 1994, USDA-NRCS 2000). Climate has affected the formation of the area encompassing Cape May County since the Pleistocene Age (i.e., 1.8 million to 11,000 years ago) (see Section 3.1.3).

3.1.2 Grounds Categories

TRACEN Cape May occupies 300 acres on Sewell Point. There are no croplands or grazing permits on the TRACEN Cape May property. Most of the habitat on the Installation has been altered and replaced by ruderal communities (habitat where the natural vegetative cover has been disturbed by humans). The areas include roadsides, fields, lawns, waste places, etc. The old runways on TRACEN Cape May are laid out such that they impound water and create wetland hydrology. However, some of these sites still have asphalt underneath them and are not considered jurisdictional wetlands (Dames and Moore 1994).

Improved grounds are developed areas of the TRACEN Cape May that have either an impervious surface (e.g., sidewalks, roads, and buildings) or landscape plantings that require intensive maintenance and upkeep. Examples of improved grounds at TRACEN Cape May include the Officer's Mess Hall, the transient housing facility, Child Care Center, and Chapel (Dames and Moore 1993).

Semi-improved grounds on TRACEN Cape May exist where periodic grading or maintenance is performed for operational reasons. Semi-improved grounds include the Facility running track and ball fields. This area is heavily vegetated and includes an open field that is mowed during the growing season for physical exercise training events. There are other open grassy areas that are commonly mowed during the spring and summer months. The remaining semi-improved grounds are used for vehicle parking, equipment and material storage, Installation roads, and maintenance activities (Dames and Moore 1993).

Unimproved grounds on TRACEN Cape May include an extensive 27 acres of wetlands and over 100 acres in the form of forest and open areas. The coastal beaches and sand dunes have not been improved from their natural conditions, although erosion is quite common in these areas from the constant weathering from the ocean and tides (TRACEN 1997).

3.1.3 Topography and Geology

The Cape May peninsula is located within the Outer Coastal Plain Physiographic Region that forms the southern tip of New Jersey. The surface geology of the area contains unconsolidated deposition that reflects the periglacial conditions of the region. The glaciers did not reach as far south as Cape May County, but the melt water from the glaciers is believed to have covered almost all of the county, which affected the geology of the area. Rounded quartzose gravel that is believed to have been smoothed by these glacial waters during the Pleistocene Age can be found in all areas of Cape May County in varying abundances (Dames and Moore 1993, Dames and Moore 1994, USDA-NRCS 2000, SCS 1977).

The most extensive surface geology that is exhibited in the region is the Cape May Formation, which rests over the Cohansey Formation. These formations are composed of sand and gravel and smaller amounts of silt and clay. The Cape May Formation ranges in thickness from a few feet to 130 feet (SCS 1977).

The topographical relief of an area causes differences in free drainage, surface runoff, soil temperature, and the extent of geologic erosion. The relief in Cape May County is determined by the type of underlying bedrock, the geology of the area, and the extent the landscape is dissected by streams (USDA-NRCS 2000).

Sewell Point is characterized by remnant natural barrier islands along the ocean and lands that have been created with dredge spoil material that has been deposited since the late 19th century. Past fill events have created a topographic surface that is generally flat, with only slight gradients (generally less than two percent) that are imposed to drain water away from specific activity areas. As a result, the intervening spaces are generally topographic depressions. Run-off waters from higher areas (and perhaps shallow groundwater seepage) are collected and retained by these depressions within the landscape (Dames and Moore 1994).

3.1.4 Soils

The parent material found within Cape May County is largely responsible for the chemical and mineralogical composition of the soils. The soils of the area can be correlated to the geology of the region. Nearly all of the soils in the area were formed in unconsolidated geologic deposits, reworked unconsolidated deposits, or in organic deposits probably of the Pleistocene Age. Melt waters from the glaciation of the Pleistocene Age are thought to have covered all of the area and mixed the materials of the older marine deposits (USDA-NRCS 2000).

The USDA's Soil Conservation Service (SCS) (subsequently renamed the Natural Resource Conservation Service [NRCS]) mapped and classified the TRACEN's soils in 1977 (SCS 1977). Figure 3-1 depicts the soil geography of the Installation as determined by the 1977 SCS survey. NRCS is in the process of updating this soil survey which should be completed by 2003. The predominant soil type at TRACEN Cape May is Coastal Beach-Urban Land Complex (CU). Two other soil types, Sandy Fill Land (FL) and Sandy Fill/Organic Substratum (FM), are typified by areas that have fill materials averaging several feet in thickness and include some of the areas of the Installation lying along the beaches of the Atlantic Ocean (Dames and Moore 1994). Table 3-1 provides a summary of the Installation soil types and their associated properties.

Table 3-1. Properties of the Soil Types Found at TRACEN Cape May

Name	Type	Drainage	Properties	Slope ¹
Coastal Beach – Urban Land Complex (CU)	Loamy Sand	Well Drained	Naturally excessive drainage. Low fertility and organic matter content.	0-5%
Sandy Fill (FL)	Sand	Well Drained	Found within the Coastal Beach-Urban land Complex (CU). Sandy with low water capacity. Permeability is rapid. Vegetation is difficult to establish due to the infertility and low organic matter content of the soils.	0-5%
Sandy Fill / Organic Substratum (FM)	Loamy Sand	Well Drained	Found within the Coastal Beach-Urban land Complex (CU). Fine to coarse sand or gravel with low available water capacity. Permeability is rapid. There is little to no vegetation due to the low organic matter content and naturally low fertility of the soils.	0-5%

Source: SCS 1977, USDA-NRCS 2000

¹ Slope is the average grade of a particular phase in a soil series. Phases are divisions of soil series defined by differences in textural class, slope degree of erosion, stoniness, or depth to bedrock.

The Coastal Beach-Urban Land Complex (CU) is equally distributed within the undeveloped coastal beaches and coastal beach areas that are utilized for residential and commercial purposes. These soils are very low in fertility and organic content, although they have naturally excessive drainage. This soil complex generally consists of fill material that ranges from 2 to 4 feet in thickness (Dames and Moore 1994, SCS 1977, USDA-NRCS 2000).

Urban land on TRACEN Cape May consists of Sandy Fill Land (FL) where the surface is covered with asphalt, concrete, buildings, or other impervious materials. These soils are sandy, infertile, have low available water capacity, rapid permeability, and low organic-matter content. Vegetation that is not tolerant to sandy, droughty sites is difficult to establish unless topsoil is added to the area.

Only a small portion of TRACEN Cape May contains Sandy Fill/Organic Substratum (FM). Due to the alterations from diking, dredging, and filling, the soil has changed and dredged materials range from fine sand to coarse sand and gravel as much as 2 inches in diameter. Fill materials

average about 3 to 5 feet in depth, with a maximum possibly reaching 20 feet. These soils have rapid permeability and the available water capacity is low. The organic-matter content and natural fertility of the area is low, with little to no vegetation (SCS 1977, USDA-NRCS 2000).

The coastal beach soils are similar to that of the barrier beach islands of Sewell Point. The areas on TRACEN Cape May that are characteristic of the coastal beach soils are within the beach and dunes bordering the Atlantic coast. The soil materials found in this area are fine sand and commonly contain many shell fragments. While these areas have remained undeveloped, erosion is evident along the beach because they are constantly being reworked by ocean waves and tides (SCS 1977, Dames and Moore 1994, USDA-NRCS 2000).

Chemical changes and iron transfer are common within the soils of Cape May County. Iron is transferred into wet soils where iron is segregated in mottles (i.e. spots or blotches of different color or shades of color interspersed with the dominant color). However, the amount of iron is reduced in soils that are wet for long periods of time, leaving the soils gray because iron levels are reduced rather than oxidized (SCS 1977).

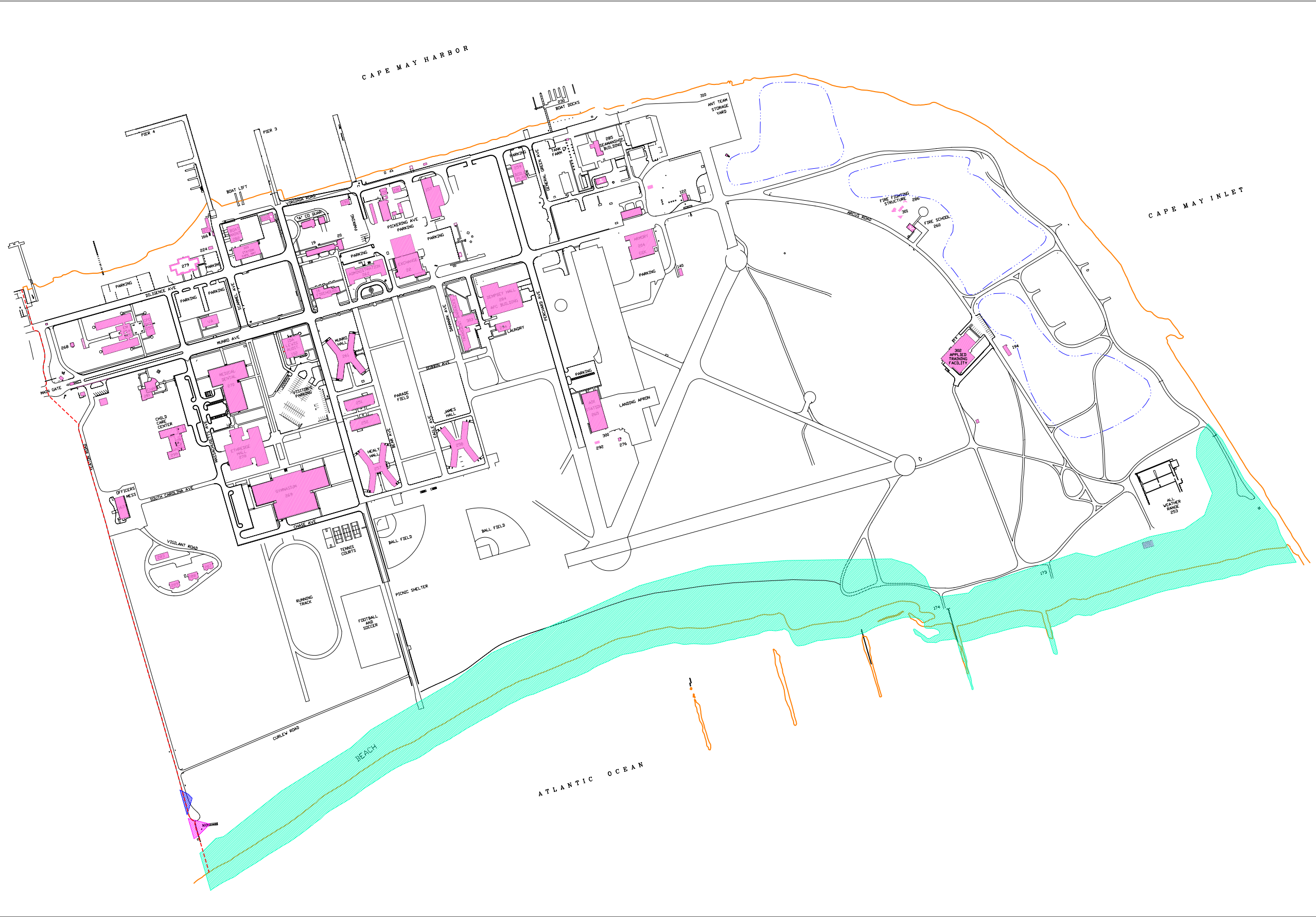
Due to the alteration from the deposition of fill and dredge materials, the soils at TRACEN Cape May often lack hydric soil indicators (such as hydrophytic vegetation, color indications) that are important for determination of jurisdictional wetlands (Dames and Moore 1994).

3.1.5 Surface Water and Coastal Management Zones

The hydrology of the area is driven by tidal waters with most of the water available to support local hydrological conditions delivered as precipitation (Dames and Moore 1993, Dames and Moore 1994).

As previously discussed, the soils of the area contain coarse-grained, high permeability surface materials that generally limit the formation of natural channels. Substrates in the area are saturated by shallow groundwater that never reaches the surface. There are possibly shallow groundwater intrusions that are being delivered from the large wetlands system that lies west of the Installation. Large upland drainage areas provide a reliable water source for the area that causes long-term saturation (i.e., ponded, topographical depression areas). Water movement with the topographical features of the area is also important in the formation of soils because it aids chemical reactions and is necessary for leaching (Dames and Moore 1993, Dames and Moore 1994).

Curlew and Yeaton Roads, as well as the running track, have previously increased the impoundment and retention of collected waters on the Installation. Development of structures such as storm sewers for street drainage and roof-top runoff also contribute to the volume of water that is delivered to certain areas. Surface run-off from the central campus and support area contributes to the delivery of waters. However, excessive run-off from these areas may increase the flooding hazard in low-lying areas. Such run-off in these areas is regulated under COMDTPUB P11300.3, *Stormwater Management* Guide and the National Pollution Discharge Elimination System (NPDES), which also regulates waste discharges (Dames and Moore 1993, Dames and Moore 1994, USDA-NRCS 2000, COMDTINST M5090.3, TRACEN 2002).

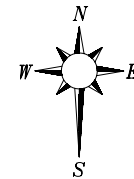


LEGEND

- Base Boundary
- Buildings
- High-Tide Line
- Dredge Spoil Areas
- TRACEN Detail

Soils:

- Ptt
- BEAV
- URPVR
- URPTS



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SCALE IN FEET

Figure 3-1. Soil Geography
of TRACEN Cape May

The beach habitat that borders the Atlantic Ocean is characterized by harsh upland areas where the vegetation tends to be sparse. However, the primary and secondary dunes that extend back from these low-lying sandy beaches are more sheltered and provide for an increased level of vegetation. These areas lie within an estuarine wetland system. The tides play an important role in diluting the semi-enclosed coastal sea waters with fresh water, forming saltmarsh communities (Dames and Moore 1994).

It is the policy of the USCG to preserve, protect, and, where possible, to restore or enhance, the resources of the nation's coastal zone. The coastal zone includes coastal waters and adjacent shore lands, the limits of which are determined by the State of New Jersey. Federally held lands are excluded from the coastal zone, but activities on Federal lands with effects that spill over into the coastal zone require consistency with state coastal zone management requirements in accordance with Section 307 of the Coastal Zone Management Act, as amended.

New Jersey's coastal zone is vulnerable to a number of coastal hazards including chronic and episodic erosion, flooding, storm surge, tropical and extratropical storms, wind, and sea level rise. Many areas of the coast were developed long before there was an understanding of coastal hazards. As a result, large areas of dense development exist in areas subject to coastal hazards. Coastal zone management at TRACEN Cape May is important for the management of stochastic (involving chance or probability) events, which can threaten USCG property or significantly alter sensitive species habitat.

New Jersey protects coastal waters and the land adjacent to them under a variety of laws, including the Waterfront Development Law (New Jersey Statutes and Acts (N.J.S.A.) 12:5-3), the Coastal Area Facility Review Act (N.J.S.A. 13:19), and the Wetlands Act of 1970 (N.J.S.A. 13:9A). NJDEP applies the New Jersey Coastal Permit Program Rules (New Jersey Annotated Code (N.J.A.C.) 7:7) and the Coastal Zone Management Rules, (N.J.A.C. 7:7E), to determine what may or may not be built in coastal zones.

In the event that USCG actions or activities may impact the coastal zone, the *Coastal Zone Management Coordination Procedures* (COMDTINST 16004.1A) shall be consulted, which assure compliance with the Coastal Zone Management Act (CZMA) (16 U.S.C. §§1451 to 1464). The CZMA encourages states to manage and conserve coastal areas as unique and irreplaceable resources (TRACEN 05 #12). TRACEN Cape May also coordinates with the New Jersey Coastal Management Program for any activities that occur within the coastal management zone (CMZ). Specific procedures implemented by TRACEN Cape May in relation to the management of natural resources in CMZs is presented in Section 4.8.

Almost all of southern Cape May County is within the 100-year and 500-year floodplains. The 100-year flood, or intermediate regional tide, would have an elevation of 10.0 feet above mean sea level. The 500-year flood, or standard project tide, would have an elevation of 14.0 feet above mean sea level. The September 1944 hurricane that struck New Jersey had a tide 8.0 feet above mean sea level.

In a 100-year flood, or intermediate regional tide, all of TRACEN Cape May would be flooded. In a 500-year flood, or standard project tide, all of the region, including the protective barrier dunes, would be underwater. In either event, virtually all the buildings at TRACEN Cape May would be destroyed or severely damaged. FEMA has not included TRACEN Cape May in current Flood Insurance Rate Maps (FIRM), however lower elevations inland of the Installation have been designated in the 100-year floodplain.

3.2 GENERAL BIOTIC ENVIRONMENT

This section describes the general biotic environment of TRACEN Cape May and the surrounding area, including wetlands, current native vegetative cover, lawn and landscaped areas, native fauna, and wildlife habitats present on the Installation.

3.2.1 Wetlands

The function of a wetland is the result of the interactions among the geology, soil, water, and vegetation within a watershed. Wetlands provide important habitat for many plant and animal species federally listed as threatened or endangered. In addition, they also provide essential nesting, migratory, and wintering areas for a majority of the nation's migratory bird species. The health and functionality of the wetland environments at TRACEN Cape May are indicators for the health of these natural processes and the viability of species at the Installations. Protecting and restoring the extensive wetland features of the TRACEN Cape May promotes these natural interactions and conserves important habitats.

Ground-level wetland delineations were conducted at TRACEN Cape May in 1993 and 1994 (Dames and Moore 1993, Dames and Moore 1994) to identify federal and state jurisdictional wetlands on the property. This delineation noted that wetland areas are human induced, indicating that past land use activities (diking, ditching, road/airfield building, etc.) have created conditions that result in long-term soil saturation. Some lawns, stormwater management areas (e.g., swales), and other disturbed areas may exhibit wetland characteristics (Dames and Moore 1994).

Despite the coastal location of TRACEN Cape May, most wetlands on the site are derived from the palustrine emergent system and have persistent herbaceous vegetation, as described by Cowardin, et al. (1979). The palustrine system includes all non-tidal wetlands, all such wetlands that occur in tidal areas where the salinity due to ocean-derived salts is below 0.5 parts per million (ppm), and those that lack active wave-formed or bedrock shoreline. Palustrine scrub/shrub wetlands, dominated by broad-leaved deciduous shrubs, also occur to a limited extent at TRACEN Cape May (Dames and Moore 1993, Dames and Moore 1994).

The 1993 and 1994 delineations and the FWS National Wetlands Inventory (NWI) maps also identify wetlands derived from the marine (intertidal) and estuarine (intertidal) systems. Tidal waters and shallow ground water drive the hydraulic regime of these wetlands (Dames and Moore 1994).

The wetlands at TRACEN Cape May were ranked for quality based on *NJAC 7:7A-2.5, Freshwater Wetlands Protection Act Rules*. None were considered exceptional, some were considered ordinary, and the majority were considered intermediate (TRACEN 1994).

Ordinary freshwater wetlands are those that do not exhibit the characteristics of exceptional wetlands, and which are (1) isolated, (2) more than 50 percent surrounded by development, and (3) less than 5,000 square feet (ft²). Development includes lawns, maintained landscaping, impervious surfaces, and graveled or stoned parking/storage areas and roads. Development included in the 50 percent criteria must be within 50 feet of the wetland. These include wetlands in drainage ditches, swales, or stormwater detention facilities (TRACEN 1994). Exceptional wetlands are defined as those that discharge into freshwaters, originating from federal or state parks, forests, and fish and wildlife lands that are not subject to wastewater discharges. They also include wetlands that discharge into waters used by trout for spawning or nurseries, and those that

provide habitat for threatened and endangered species. Intermediate wetlands are those which are not classified as ordinary or exceptional.

A total of 27 acres of wetlands, as shown in Figure 4-11, have been identified at TRACEN Cape May. Table 3-2 identifies the wetland types at TRACEN Cape May and their descriptions based upon the Cowardin Classification System. A complete description of the delineated wetland sites is available in the 1993 and 1994 wetland delineation reports (Dames and Moore 1993, Dames and Moore 1994).

Table 3-2. Wetland Types at TRACEN Cape May

Cowardin Wetland Classification	Ecological System	Class	Water Regime
PSS1B/PEM1B	Palustrine	Shrub-Scrub (Broad-leaved Deciduous)/ Emergent (Persistent)	Saturated, Frequently Flooded
PEM1B	Palustrine	Emergent (Persistent)	Saturated
PEM1C	Palustrine	Emergent (Persistent)	Seasonally flooded
PEM1Y	Palustrine	Emergent (Persistent)	Semi-permanently/ Seasonally Saturated
E2EM1P	Estuarine, Intertidal	Emergent (Persistent)	Irregularly Flooded by Tides
E2SS1P	Estuarine, Intertidal	Scrub/Shrub	Irregularly Flooded by Tides
E2EM1P/ E2SS1P	Estuarine, Intertidal	Emergent (Persistent)/ Scrub-Shrub (Broad- Leaved Deciduous)	Irregularly Flooded by Tides
M2BB	Marine, Intertidal	Beach/Bar	Tidal
MODD	--	Disturbed	--
MODL	--	Managed	--

Source: Dames and Moore 1993, 1994

3.2.2 Current Vegetative Cover

TRACEN Cape May is located in the Eastern Broadleaf Forest (Oceanic) Ecoregion Province as described by Bailey in *Description of the Ecoregions of the United States* (Bailey 1995). This province is characterized by a winter (or temperate) deciduous forest, dominated by tall broadleaf trees that provide a continuous dense canopy in the summer, but shed their leaves completely in winter. Lower layers of small trees and shrubs are weakly developed. In spring, a ground cover of herbs quickly develops, but is greatly reduced after trees reach full foliage and shade the ground (Bailey 1995). The Installation is on the edge of this ecoregion due to the microclimate associated with this coastal region.

Vegetation communities at TRACEN Cape May can be characterized as ruderal, forested, beach, dunes, and wetlands (Dames and Moore 1994). Much of the vegetation supported at TRACEN Cape May comprises remnants of other natural communities and are currently maintained (i.e., mowed) for aesthetic purposes. The following provides a brief description of the vegetation communities found on TRACEN Cape May.

Ruderal Communities. This community includes disturbed roadsides, fields, lawns, waste places, and even some wetland areas. The most abundant species in both wetland and upland sites in the ruderal community is the common reed (*Phragmites australis*). This plant has colonized many disturbed sites. Old-field and established forested communities have succeeded to common reed stands (Dames and Moore 1994). Common reed is considered an exotic, invasive, and noxious weed plant species (see Section 3.2.3).

Exotic weedy species such as Johnson grass (*Sorghum halapense*), Japanese honeysuckle (*Lonicera japonica*), bull thistle (*Cirsium vulgare*), sheep sorrel (*Rumex acetosella*), cat's-ear (*Hypochaeris radicata*), and curly dock (*Rumex crispus*) are also common in this community (Dames and Moore 1994). Refer to Section 3.2.3 for a discussion of the planted lawn grasses and herbaceous species supported in maintained areas such as lawns.

Estuarine plants such as saltmeadow hay (*Spartina patens*) and black-grass (*Juncus gerardii*) are found in the wetlands in this community. However, these areas are not considered tidal marshes because the soils are comprised of salty dredge deposits that are able to support these alkaline species (Dames and Moore 1994).

Forested Communities. The forested communities on TRACEN Cape May represent small remnants of this habitat type. These communities are generally in transition from primary to secondary successional forests and support a variety of canopy and sub-canopy species. The canopy of the forested communities is dominated by red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), pitch pine (*Pinus rigida*), and red cedar (*Juniperus virginiana*).

The sub-canopy of these forested communities support fire cherry (*Prunus pensylvanicum*), Carolina rose (*Rosa carolina*), blackberry (*Rubus* sp.), black willow (*Salix nigra*), sassafras (*Sassafras albidum*), and willow oak (*Quercus phellos*).

Beach Communities. Plants in the beach community must endure extreme conditions, including the rigors of storms and the stress of dehydration, and therefore tend to be sparse. Species that have adapted to these conditions at TRACEN Cape May include American searocket (*Cakile dentula*), coast-blite goosefoot (*Chenopodium rubrum*), and beach-heath (*Hudsonia tomentosa*).

Dune Communities. The plants supported in this community are farther away from the ocean than the beach community and more sheltered from the elements. Therefore, more and diverse plant species colonize this community. Primary and secondary dunes are dominated by beachgrass (*Panicum amarum*), bitter panic grass (*P. amarulum*), American beachgrass (*Ammophila breviligulata*), American wormseed (*Chenopodium ambrosioides*), seaside goldenrod (*Solidago sempervirens*), bayberry (*Myrica pennsylvanica*), and black cherry (*Prunus serotina*) (Dames and Moore 1994).

Wetlands. The most extensive wetland type at TRACEN Cape May is derived from the palustrine system. Precipitation and overland flow from roads, parking lots, and other features in the surrounding landscape drive the hydrology of these wetlands (see Figure 4-11). Palustrine wetlands support a variety of species. However, the species diversity is declining as common reed infests more and more of these areas (See Section 3.2.3). Slender flatsedge (*Cyperus filicinus*)

dominates one of the palustrine wetland units that are frequently mowed, providing nearly 66 percent cover (Dames and Moore 1994). In addition to slender flatsedge, saltmarsh false-foxglove (*Agalinis maritima*), and beach sea-purslane (*Sesuvium maritimum*) occurred in these maintained wetlands. Other species found in palustrine wetlands at the Installation include saltmeadow cordgrass (*Spartina patens*), American bugleweed (*Lycopus americanus*), coast cockspur (*Echinocloa walteri*), Florida paspalum (*Paspalum floridanum*), Pennsylvania smartweed (*Polygonum pennsylvanicum*), purple false-foxglove (*Agalinis purpurea*), and elderberry (*Sambucus canadensis*) (Dames and Moore 1994).

The estuarine wetland system at TRACEN Cape May supports species indicative of salt marshes. These are semi-enclosed areas where seawater is diluted by freshwater, and where tides play a significant role in vegetation distribution. Saltmarsh cordgrass (*Spartina alterniflora*) occupies the areas between mean low water and mean high water marks as it has a high tolerance for salt and is able to survive in a somewhat submerged state. Common associates of this plant, growing in the upper end of the intertidal zone, are saltmarsh camphor-weed (*Pluchea purpurascens*), Carolina sea-lavender (*Limonium carolinianum*), glassworts (*Salicornia bigelovii* and *S. europea*), and white sea-blite (*Suaeda maritima*) (Dames and Moore 1994).

Just above the mean high water mark, saltmeadow cordgrass typically dominates, forming dense mats that prevent the growth of other species. In areas where the soil is heavily saturated or salinity is high, seashore saltgrass (*Distichlis spicata*) occurs with saltmeadow cordgrass, or even replaces it forming monotypic stands (Dames and Moore 1994). Further upslope from the mean high tide, where fresh water intrusion increases, these species are replaced by black-grass. Beyond this area, shrubby wetland species may occur, including marsh-elder (*Iva frutescens*) and groundsel-tree (*Baccharis halimifolia*) (Dames and Moore 1994). Just as in the palustrine system, these wetlands support a variety of plant species. However, this diversity is decreasing with the infestation of common reed (see Section 3.2.3).

3.2.3 Invasive, Exotic, and Noxious Species

At the present time, the New Jersey Department of Agriculture, Division of Plant Industry does not classify any plants as “noxious weeds” (New Jersey Department of Agriculture, Division of Plant Industry 2000). However, the New Jersey Department of Agriculture does prohibit or restrict seeds in agricultural, flower, tree, shrub, and/or land and turf seed. As defined by Title 4 (Agriculture and Domestic Animals), Section 4:8-17.13 (Definitions) of the New Jersey Permanent Statutes, “prohibited noxious weed seeds” are the seeds of perennial weeds such as not only reproduced by seed but also spread by underground roots, stems and other reproductive parts, and which when well established, are highly destructive and difficult to control in this State by ordinary good management practices. This statute defines “restricted noxious weed seeds” as the seeds of such weeds as are very objectionable in fields, lawns or gardens of this State, but can be controlled by good cultural practices. Table 3-3 lists the seeds designated as prohibited or restricted by the Noxious Weed Seed Regulations.

Common reed, or *Phragmites*, widely recognized as an invasive, noxious species in many other states, has become extensively established in the wetlands, and even uplands, of TRACEN Cape May as shown in Figure 3-2. Common reed is a tall perennial wetland grass ranging in height from three to thirteen feet. Strong, leathery, horizontal shoots, called rhizomes, growing on or beneath the ground surface, give rise to roots and tough vertical stalks. These stalks support broad sheath-type leaves that are one-half to two inches wide near the base, tapering to a point at the ends. The foliage is gray-green during the growing season, with purple-brown plumes

Table 3-3. Noxious Weed Seeds of New Jersey

Common Name	Scientific Name	Status	Regulated Seed Type
Bindweed	<i>Convolvulus arvensis</i>	Prohibited	Agricultural, flower, tree, shrub, lawn and turf seed
Hedge bindweed	<i>Convolvulus sepium</i>	Prohibited	Agricultural, flower, tree, shrub, lawn and turf seed
Quackgrass	<i>Agropyron repens</i>	Prohibited	Agricultural, flower, tree, shrub, lawn and turf seed
Canada thistle	<i>Cirsium arvense</i>	Prohibited	Agricultural, flower, tree, shrub, lawn and turf seed
Horse nettle	<i>Solanum carolinense</i>	Prohibited	Agricultural, flower, tree, shrub, lawn and turf seed
Dodder	<i>Cuscuta</i> spp.	Restricted	Agricultural, vegetable flower, or shrub seed
Corn cockle	<i>Agrostemma githago</i>	Restricted	Agricultural, vegetable flower, or shrub seed
Wild garlic	<i>Allium vineale</i>	Restricted	Agricultural, vegetable flower, or shrub seed
Wild onion	<i>Allium canadense</i>	Restricted	Agricultural, vegetable flower, or shrub seed
Cheat	<i>Bromus secalinus</i>	Restricted	Agricultural, vegetable flower, or shrub seed
Bermuda grass	<i>Cynodon dactylon</i>	Restricted	Agricultural, vegetable flower, shrub, lawn and turf seed
Johnson grass	<i>Sorghum halepense</i>	Restricted	Agricultural, vegetable flower, or shrub seed
Spurred anoda	<i>Anoda cristata</i>	Restricted	Agricultural, vegetable flower, or shrub seed
Giant ragweed	<i>Ambrosia trifida</i>	Restricted	Agricultural, vegetable flower, or shrub seed
Bur cucumber	<i>Sicoyos angulatus</i>	Restricted	Agricultural, vegetable flower, or shrub seed
Annual bluegrass	<i>Poa annua</i>	Restricted	Lawn and turf seed
Rough bluegrass	<i>Poa trivialis</i>	Restricted	Lawn and turf seed
Bentgrass	<i>Agrostis</i> spp.	Restricted	Lawn and turf seed
Meadow fescue	<i>Festuca pratensis</i>	Restricted	Lawn and turf seed
Tall fescue	<i>Festuca arundinaceae</i>	Restricted	Lawn and turf seed
Orchardgrass	<i>Dactylis glomerata</i>	Restricted	Lawn and turf seed
Timothy	<i>Phleum pratense</i>	Restricted	Lawn and turf seed
Velvetgrass	<i>Holcus lanatus</i>	Restricted	Lawn and turf seed

Source: New Jersey Department of Agriculture, Division of Plant Industry 1999



Figure 3-2. Photograph of the Domination by Common Reed in the Wetlands

sometimes confused with common reed. It can be distinguished from common reed by its sparse flowering structure and long narrow leaves (VANHP 2001). Common reed thrives in sunny wetland habitats and also grows along drier borders and elevated areas of brackish and freshwater marshes, along riverbanks and on lakeshores. The species is particularly prevalent in disturbed or polluted soils found along roadsides, ditches and dredged areas (VANHP 2001). Specific control of exotic species is described in Section 4.7

Other exotic species on the Installation include Johnson grass (*Sorghum halepense*), Japanese honeysuckle (*Lonicera japonica*), bull thistle (*Cirsium vulgare*), sheep sorrel (*Rumex acetosella*), cat's-ear (*Hypochoeris radicata*), and curly dock (*Rumex crispus*). Although these exotic species have become established at TRACEN Cape May, they are not nearly as extensive as the common reed infestation. Stands of the exotic black pine (*Pinus thunbergii*) are supported in dense stands along the beach at TRACEN Cape May. Another exotic tree found at the TRACEN is autumn-olive (*Eleagnus ubellata*). Although these species do occur at the site, they have not proved problematic.

3.2.4 Lawn and Landscaped Areas

Much of the natural vegetation has been altered at TRACEN Cape May to accommodate the past runway development and other facilities, such as training buildings, housing, and recreational areas, in support of the USCG's mission. Maintained areas support planted native lawn grasses and herbaceous species such as panic grasses (*Panicum* spp.) and rough buttonweed (*Diodia teres*), as well as exotics including sheep sorrel, cat's ear, and curly dock (Dames and Moore 1994).

During the development of this INRMP, the personnel at TRACEN Cape May were in the process of updating the Installation Master Plan, which typically outlines landscaping practices for maintained lawns and plantings. Three types of landscaping plans should be considered and evaluated for TRACEN Cape May. They include:

1. **Native Planting Plans:** This approach encompasses native plant material in groupings. This approach mimics the natural planting of trees and shrubs, requires initial maintenance requirements, and works toward long-term low maintenance.
2. **Formal Planting Plans:** This landscape design has uniform and regimented spacing of plantings. These are pruned incessantly so as not to take on natural forms. The costs of maintenance are very high.
3. **Naturalistic Planting Plans:** This is a combination of the above two planting types. Native and non-native plants can be planted together to create a unique look. This approach allows some flexibility towards the overall landscape design.

Because of the regimented design of the cantonment area at TRACEN Cape May, and the sensitive, natural beach and forest environments, the “Native Planting Plan” is the most appropriate for the site. For all future plantings, native trees, shrubs and plants should be used. Table 3-4 briefly describes the physical characteristics of some species suitable for use in landscaping at TRACEN Cape May. Appendix D-1 identifies additional species that are appropriate to use during future landscaping projects at the TRACEN.

3.2.5 Native Fauna on the Installation

As previously described, TRACEN Cape May is composed of diverse grassland, forest, beach, and wetland habitats that supports a diversity of animal species, including at least two federally and state-listed threatened and endangered species. Although limited recreational fishing access is provided at the jetty on the southeast corner of TRACEN Cape May, the USCG has no management responsibility for this fishery. However, species that frequent the shores of the Installation are discussed below.

3.2.6 Birds

Executive Order 13186, *Protection of Migratory Birds* directs Federal agencies taking actions that have, or are likely to have, a measurable negative effect on migratory. The topography of New Jersey acts as a funnel for migrating birds because it rests between the Delaware River and the Atlantic Ocean. Birds avoiding these waters find their way to Cape May awaiting favorable weather before crossing the bay. This makes Sewell Point one of the most prominent locations along the Atlantic flyway for migrating songbirds, waterfowl, shorebirds, and raptors. The Atlantic flyway, as shown in Figure 3-3, may be described as extending from the offshore waters of the Atlantic Coast west to the Allegheny Mountains where, curving northwestward across northern West Virginia and northeastern Ohio, it continues in that direction across the prairie provinces of Canada and the Northwest Territories to the Arctic Coast of Alaska. The flyway embraces several primary migration routes and many more that are important as tributaries, some of the latter being branches from primary routes of other flyways. The Atlantic flyway route from the northwest is of great importance to migratory waterfowl and lesser scaups (*Aythya affinis*) that winter on the waters and marshes of Delaware Bay. The coastal route of the Atlantic Flyway, which in general follows the shoreline, has its northern origin in the eastern Arctic islands

and the coast of Greenland. Birds migrating south from the Arctic islands, Greenland, eastern Canada, norther Midwest, and New England are funneled through the Cape May region prior to crossing the Delaware Bay. This funneling creates the potential for high avian richness at TRACEN Cape May during migration periods.

Table 3-4. Native Plants to be used in Future Landscaping of TRACEN Cape May

Common Name	Scientific Name	Height (ft)	Description
Coastal Serviceberry	<i>Amelanchier obovalis</i>	15-25	This species has obovate to ovate 1 to 3 inch long green leaves. In the fall, the leaves range from crisp yellow to brilliant bronze-red. The flowers appear from April to May. This period can shorten by extremely warm weather. The reddish-purple fruit attracts a wide variety of birds.
American Holly	<i>Ilex opaca</i>	40-70	American Holly is a beautifully shaped tree, with a symmetrical, dense, wide pyramidal form. The spiny, dull green leaves are accented with clusters of red berries which persist throughout the fall and winter. These red berries attract a wide variety of birds. This type of holly can tolerate both shade and sunlight. These plants can be grown in clay, loam, and sand, slightly alkaline soil, in a sunny or shady location.
Northern Bayberry	<i>Myrica pensylvanica</i>	30	Northern Bayberry has inconspicuous early spring flowers which give rise to a beautiful, fragrant fruit. The leaves are dark green, deciduous and aromatic when crushed. Winds usually strip the branches of all leaves soon after frost, usually in November. Bayberry can be established by seeding 1/2" deep or by transplanting as a balled container-grown shrub.
Winterberry Holly or Common Winterberry	<i>Ilex verticillata</i>	6-20	Common winterberry is a shrub usually from 6 to 8 feet high with grayish bark and smooth twigs. The leaves are from 2 to 3 inches long and about an inch wide. They are usually rather thick and sharply toothed. In autumn the leaves turn black. The flowers, which appear from May to July, are small and white. The bright-red, shining fruits about the size of a pea and each containing about six seeds, are clustered around the stem.
Black Gum	<i>Nyssa sylvatica</i>	75-80	The leaves of the Black Gum are shaped ovately, and have a wavy, entire margin. The bark is reddish brown in color and broken into long irregular ridges and lozenge- shaped plates. The flowers are yellowish green, staminate and pistillate being on different trees. The flowers appear from April to June, and by October, a bluish black fruit about a half-inch long, appears on the tree.



Figure 3-3. Diagram of the Atlantic Flyway in Relation to TRACEN Cape May

Appendix D-5 presents a list of bird species with the potential to occur on TRACEN Cape May. Detailed avifauna studies have not been performed at TRACEN Cape May. However, information gathered during other studies, including American Breeding Bird Surveys, have contributed to this list. Breeding bird species are noted with an asterisk, and abundance is noted as (C) – common more than 20 individuals per day; (F) - fairly common, usually seen, 5 to 20 individuals per day; (U) – uncommon, seen in limited numbers, 1 to 4 per day; (S) - scarce usually present, but not seen daily; (R) – rare, seen only a few times per season; and (V) - very rare or very infrequent, fewer than 1 record per season. Other species whose ranges are primarily to the south or west may also be sighted at the TRACEN as transients, or, less likely, as seasonal breeders.

Raptors. Some of the common raptors (i.e., birds of prey) that have the potential to migrate through TRACEN Cape May include the sharp-shinned hawk (*Accipiter striatus*), turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), and the broad-winged hawk (*Buteo platypterus*). The northern harrier (*Circus cyaneus*) and osprey (*Pandion haliaetus*) are listed as endangered and threatened, respectively, by the state of New Jersey, and could occur at TRACEN Cape May. Raptors migrating through the area prey on small mammals, including mice and shrews, reptiles, insects and other birds. The relative abundance of migrating raptors in the area is illustrated by Table 3-5. The raptor migration totals presented in this table are from the Cape May Bird Observatory fall hawk watch.

Table 3-5. Raptor Migration Totals - September 1, 2001 through November 30, 2001

Species	Season Total	Peak Flight #	Peak Flight Date
Black vulture	104	25	11-Nov, 17-Nov
Turkey vulture	1,051	200	11-Nov
Osprey	1,645	143	29-Sep
Bald eagle	229	16	7-Oct
Northern harrier	1,204	76	27-Oct
Sharp-shinned hawk	12,927	730	18-Oct
Cooper's Hawk	1,874	92	28-Oct
Northern goshawk	29	5	17-Nov
Red-shouldered hawk	343	61	28-Oct
Broad-winged hawk	1,229	421	28-Sep
Swainson's hawk	1	1	26-Oct
Red-tailed hawk	1,049	168	28-Oct
Rough-legged Hawk	0	0	-
Golden eagle	10	3	6-Nov
American kestrel	5,188	944	7-Oct
Merlin	1,380	177	25-Oct
Peregrine falcon	588	55	6-Oct
Total	28,851	1,827	7-Oct

Source: Cape May Bird Observatory 2002

Wading Birds, Shorebirds, and Waterfowl. The wetland and beach habitats at TRACEN Cape May provide excellent habitat for many species of wading birds, shorebirds, and waterfowl. The mute swan (*Cygnus olor*), American black duck (*Anas rubripes*), mallard (*Anas platyrhynchos*), double-crested cormorant (*Phalacrocorax auritus*), and American widgeon (*Anas Americana*) are waterfowl species commonly observed at TRACEN Cape May. The wetland communities of the region support large numbers of other migrating waterfowl, many of which remain throughout the winter. Species such as wood duck (*Aix sponsa*), blue-winged teal (*Anas discors*), green-winged teal (*A. crecca*), American widgeon (*A. americana*), mallard (*A. platyrhynchos*), gadwall (*A. strepera*), northern shoveler (*A. clypeata*), northern pintail (*A. acuta*), canvasback (*Aythya valisineria*), greater scaup (*A. marila*), lesser scaup (*A. affinis*), bufflehead (*Bucephala albeola*), and Canada goose (*Branta canadensis*) often migrate throughout the region.

Common wading birds include the great blue heron (*Ardea herodias*), the snowy egret (*Egretta thula*), and the glossy ibis (*Plegadis falcinellus*) (Cape May Bird Observatory 1997).

The Delaware Bay shoreline is a major shorebird staging area in North America, second only to the Copper River Delta in Alaska. Hundreds of thousands of shorebirds, nearly 80 percent of some populations, stop to rest and feed in this region during their spring migration from South America to their breeding grounds in the Arctic. The arrival of over 20 species of shorebirds coincides with the peak horseshoe crab spawning season. Horseshoe crab eggs provide an abundant source of food for these shorebirds to replenish their energy reserves during the spring migration. Common shorebird species observed during the spring migration include: sanderling (*Calidris alba*), semi-palmated sandpiper (*Calidris pusilla*), dunlin (*Calidris alpina*), semi-

palmed plover (*Charadrius semipalmatus*), short-billed dowitcher (*Limnodromus griseus*), willet (*Catoptrophorus semipalmatus*), greater yellowlegs (*Tringa melanoleuca*), lesser yellowlegs (*Tringa flavipes*), black-bellied plover (*Pluvialis squatarola*), least sandpiper (*Calidris minutilla*), ruddy turnstone (*Arenaria interpres*), red knot (*Calidris canutus*), whimbrel (*Numenius phaeopus*), spotted sandpiper (*Actitis macularia*), and pectoral sandpiper (*Calidris melanotos*).

A population of the federally-listed as threatened, and state-listed as endangered, piping plover (*Charadrius melodus*) is known to breed at TRACEN Cape May. Five nesting pairs were observed in 1999 four of which hatched chicks. These four pairs fledged four chicks in 1999 (NJDEP-ENSP 1999). In 2000, five pairs of plovers were observed on the TRACEN Cape May beaches. Two pairs of plovers successfully hatched young fledged five chicks in 2000. In 2001, five pairs of plovers fledged four chicks from two active nests. Table 3-6 summarizes the nesting productivity of piping plovers at TRACEN Cape May. Also, the least tern (*Sterna antillarum*), state-listed as endangered, has nested on the beaches at TRACEN Cape May. Further background information on these species is presented in Section 3.2.9. Management actions implemented for these species are outlined in Section 4.3.

Table 3-6. Number of Pairs of Piping Plovers at TRACEN Cape May

Year	Number of Pairs	Pairs Hatching Eggs	Chicks Fledged
1991	3	2	4
1992	6	4	2
1993	6	3	4
1994	7	6	9
1995	6	5	6
1996	7	4	6
1997	3	1	1
1998	3	2	5
1999	5	4	4
2000	5	2	5
2001	2	2	4

Migrants. Over 100 species of neotropical migratory birds are known to occur in Cape May County, New Jersey (Cape May Bird Observatory 1997). Many of these species occur at TRACEN Cape May, likely in the available grassland, wetland, and forest habitat. The most important nesting species are those dependent upon the marshes and coastal island habitats, for example, seaside sparrow (*Ammodramus maritimus*), marsh wren (*Cistothorus palustris*), and sedge wren (*Cistothorus platensis*). A large number of birds nesting on or migrating through TRACEN Cape May are neotropical migrants (wintering in Central and South America).

3.2.7 Mammals

Despite the fact that much of the native vegetation supported at TRACEN Cape May has been disturbed or replaced with managed landscapes, a variety of mammals inhabit or use the habitat that is provided. Although surveys have never been conducted to identify species of mammals

that inhabit or migrate through TRACEN Cape May, carnivores, ungulates, and small mammals are known to occur.

Carnivores. Carnivorous species that are common in this part of New Jersey, and have the potential to migrate through or inhabit TRACEN Cape May, include the red fox (*Vulpes vulpes*) and coyote (*Canis latrans*). These species are an important component to the local ecosystems. These species prey on rodents, rabbits, and insects providing a natural means of controlling potential pest populations. In addition, feral cats exist on TRACEN Cape May and in the surrounding residential communities. Feral cat populations are managed to control their numbers as described in Section 4.6.1. These feral cat colonies have the potential to severely impact bird and small mammal populations on the Installation.

Omnivores. Omnivorous small mammals are perhaps the most abundant mammals on the Installation due to their generalist ecological niche. Due to the limited contiguous grassland or forest habitats on the Installation, mammals such as raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), and Virginia opossum (*Didelphis virginiana*) constitute some of the more common mammals found on TRACEN Cape May.

Ungulates. Due to the small size of the Installation and the limited amount of cover and browse for ungulate species, there is a limited potential for populations of ungulate species to inhabit TRACEN Cape May. White-tailed deer (*Odocoileus virginianus*) utilize the limited forage available at TRACEN Cape May. Deer are likely to occur in the developed and undeveloped areas of the Installation.

Small Mammals. Common small mammals with the potential to inhabit TRACEN Cape May include the gray squirrel (*Sciurus carolinensis*), eastern chipmunk (*Tamias striatus*), white-footed mouse (*Peromyscus leucopus*), big brown bat (*Eptesicus fuscus*), eastern cottontail (*Sylvilagus floridanus*), and cotton mouse (*Peromyscus gossypinus*).

3.2.8 Reptiles and Amphibians

Due to the topographic and regional conditions present on TRACEN Cape May, several species of herptiles have the potential to reside at TRACEN Cape May. As with mammals, surveys to identify reptiles and amphibians have not been conducted at TRACEN Cape May. However, adequate habitat exists, primarily as freshwater wetlands, to support reptiles and amphibians at the Installation.

Characteristic amphibians on the Installation include: Fowler's toad (*Bufo woodhousii fowleri*), eastern spadefoot (toad) (*Scaphiopus holbrookii holbrookii*), carpenter frog (*Rana virgatipes*), green frog (*Rana clamitans melanota*), wood frog (*Rana sylvatica*), southern leopard frog (*Rana utricularia*), and pickerel frog (*Rana palustris*). Figure 3-4 is a photograph of a northern leopard frog and Figure 3-5 is a photograph of a wood frog observed by e2M biologists at TRACEN Cape May. Appendix D-3 contains a copy of the New Jersey Division of Fish and Wildlife's *Frogs of New Jersey* (NJDEP 2001b).

Snakes characteristic of the region include the northern redbelly snake (*Storeria occipitomaculata occipitomaculata*), eastern garter snake (*Thamnophis sirtalis sirtalis*), eastern ribbon snake (*Thamnophis sauritus sauritus*), eastern milk snake (*Lampropeltis triangulum triangulum*), eastern kingsnake (*Lampropeltis getula getula*), and black rat snake (*Elaphe obsoleta obsoleta*).



Figure 3-4. Photograph of a Northern Leopard Frog



Figure 3-5. Photograph of a Wood Frog

Appendix D-2 contains a copy of the New Jersey Division of Fish and Wildlife's *Snakes of New Jersey* (NJDEP 2001a). Figure 3-6 is a photograph of a common garter snake observed by e2M biologists at TRACEN Cape May.



Figure 3-6. Photograph of a Common Garter Snake

The eastern tiger salamander (*Ambystoma tigrinum tigrinum*) (state-listed as endangered), bog turtle (*Clemmys muhlenbergii*) (state-listed as endangered and federally listed as threatened), timber rattlesnake (*Crotalus horridus horridus*) (state-listed as endangered), Cope's gray treefrog (*Hyla chrysoscelis*) (state-listed as threatened), and Northern pine snake (*Pituophis melanoleucus melanoleucus*) (state-listed as threatened) are rare reptiles and amphibians that occur in southern New Jersey, but have not been documented in the region.

3.2.9 Wildlife and Fisheries Habitat

Taken as a whole, habitat present on TRACEN Cape May has a moderate to low value in relation to its ability to support the maximum native species richness of birds, mammals, reptiles, and amphibians. However, the habitat that is present has the unique potential to support populations of sensitive species.

The beach habitat at TRACEN Cape May is the most important wildlife habitat type on the Installation. It provides natural wildlife habitat for numerous species, including two threatened and/or endangered species. The piping plover and least tern use the barrier beach as nesting and foraging habitat. The habitat results from the normal coastal processes that renew and create the beaches along the Atlantic Ocean shoreline of the Installation.

Although TRACEN Cape May is located on the ocean and recreational fishing access is permitted from the southern jetty, the USCG does not have management responsibility of the fisheries. Recreational fishery species that are likely to occur off the shore of TRACEN Cape May include summer flounder (fluke) (*Paralichthys dentatus*), haddock (*Melanogrammus aeglefinus*), porgy (scup) (*Calamus* spp.), winter flounder (*Pleuronectes americanus*), king mackerel (*Scomberomorus cavalla*), bluefish (*Pomatomus saltatrix*), cod (*Gadus morhua*), pollock (*Pollachius virens*), lobster (*Homarus americanus*), blue crab (*Callinectes sapidus*), and shark (NJDFW 2000).

Wetlands account for some of the natural wildlife habitat at TRACEN Cape May. They provide shelter and vital foraging, nesting, and breeding habitat for birds, mammals, reptiles, amphibians, and insects. Numerous species of freshwater wading birds use the wetland habitat at TRACEN Cape May. Most of the wading bird species tend to select the habitat based on such factors as water depth, substrate type, prey type, prey availability, and vegetative cover. They also provide corridors for wildlife movement and migration. Effective management of wetlands for wildlife is centered on minimizing those activities that cause habitat fragmentation and otherwise alter the natural structure of vegetation communities.

The forested regions of the Installation are not large enough to support species that require large tracts of interior forest to meet their life requirements. However, the small scale forest and brush areas support excellent populations of species adapted to utilize edge and old field habitats.

3.2.10 Threatened and Endangered Species

The FWS and NJDEP Division of Fish and Wildlife were contacted regarding the presence of threatened and endangered species in the geographic area of TRACEN Cape May pursuant to the requirements of Section 7(c) of the Endangered Species Act (16 U.S.C. 1536). Copies of these communications can be found in Appendix B. Under the Endangered Species Act, an “endangered species” is defined as any species that is in danger of extinction throughout all or a significant portion of its range. A “threatened species” is defined as any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The FWS has also presented an updated list of species that are regarded as candidates for possible listing under the Endangered Species Act. Although candidate species receive no statutory protection under the Endangered Species Act, the FWS believes it is important to advise Government agencies, industry, and the public that these species are at risk and may warrant protection under the Act in the future.

The New Jersey Permanent Statutes define endangered wildlife species as “any species or subspecies of wildlife whose prospects of survival or recruitment are in jeopardy or are likely within the foreseeable future to become so due to any of the following factors: (1) the destruction, drastic modification, or severe curtailment of its habitat, or (2) its over-utilization for scientific, commercial or sporting purposes, or (3) the effect on it of disease, pollution, or predation, or (4) other natural or manmade factors affecting its prospects of survival or recruitment within the state, or (5) any combination of the foregoing factors. The term shall also be deemed to include any species or subspecies of wildlife appearing on any Federal endangered species list” (New Jersey Permanent Statutes 23:2A-1). The New Jersey Permanent Statutes define endangered plant species as “any native plant species whose survival in the state or the nation is in jeopardy, including, but not limited to, plant species designated as listed, proposed, or under review by the Federal Government as endangered or threatened throughout its range in the United States pursuant to the “Endangered Species Act of 1973,” Public Law 93-205 (16 U.S.C. 1533), any additional species known or believed to be rare throughout its worldwide range, and any species

having five or fewer extant populations within the state” (New Jersey Permanent Statutes 13:1B-15.151).

Responses from FWS and NJDEP Division of Fish and Wildlife have documented the presence of both state- and federally listed threatened and endangered species as occurring or which have the potential to occur in the area (FWS 2002, NJNHP 2002). Copies of these responses are found in Appendix B.

The piping plover (*Charadrius melodus*), federally listed as threatened and state-listed as endangered, and the least tern (*Sterna antillarum*), state-listed as endangered, have been confirmed as breeding populations at TRACEN Cape May by FWS and NJDEP Division of Fish and Wildlife. An active management program has been in place under the direction of TRACENCMINST 16450 *Endangered Species Management Plan* (TRACEN 2001) for these species.

In addition to the piping plover and least tern, several federally and state-listed threatened and endangered species have the potential to occur at TRACEN Cape May but have not been confirmed. Seabeach amaranth (*Amaranthus pumilus*) has not been documented at TRACEN Cape May, but has been documented in Monmouth County, New Jersey and Upper Township, Cape May County, New Jersey. FWS also documents transient threatened and/or endangered species that migrate through the area. These species include, but are not limited to, federally threatened/state-endangered bald eagle (*Haliaeetus leucocephalus*) and federally endangered roseate tern (*Sterna dougallii*). NJDEP Division of Fish and Wildlife has documented occurrences of state listed wildlife in the region of the TRACEN. The yellow-crowned night-heron (*Nyctanassa violacea*) and the black-crowned night-heron (*Nycticorax nycticorax*), both state-listed as threatened, have been documented in the region.

A list of threatened and/or endangered species as well as documented rare species adjacent to TRACEN Cape May is presented in Table 3-7. While rare species have no specific legal protection under federal or state laws, these populations are monitored when practicable. Detailed information regarding threatened and endangered species known, or which have the potential to occur in the region are discussed below.

Table 3-7. Federally and State-Listed Threatened and Endangered Documented on or in the Immediate Area of TRACEN Cape May

Common Name	Scientific Name	Federal Status	State Status
BIRDS			
Piping plover*	<i>Charadrius melodus</i>	T	E
Least tern*	<i>Sterna antillarum</i>		E
Bald eagle	<i>Haliaeetus leucocephalus</i>	T	E
Roseate tern	<i>Sterna dougallii</i>	E	
Black skimmer*	<i>Rynchops niger</i>		E
Black-crowned night-heron*	<i>Nycticorax nycticorax</i>		T
Yellow-crowned night-heron*	<i>Nyctanassa violacea</i>		T
VASCULAR PLANTS			
Seabeach amaranth	<i>Amaranthus pumilus</i>	T	

Source: FWS 2002, NJNHP 2002

Notes: * Documented as occurring at TRACEN Cape May

E – Federally- or state-listed endangered species

T – Federally-or state-listed threatened species

To aid in the identification of potentially occurring threatened and endangered species, this INRMP presents a list of species and a brief description of their natural history in Appendix D. This information is in no way all inclusive, but instead is meant to supplement information kept in the natural resources manager's threatened and endangered species database.

Piping Plover (Charadrius melodus)

The piping plover (Figure 3-7), is a small plover weighing an average of 55 grams (g) and averaging about 17-18 centimeters (cm) in length. The forehead and sides of the head are plain white with a dark band across the front of the crown from eye-to-eye and black shoulder patches that often extend across the breast. The piping plover's bill is a dull orange, tipped with black, but it is dark in winter. The breeding season begins when the adults reach the breeding grounds in mid- to late-April or in mid-May in northern parts of its range.



Figure 3-7. Photograph of a Piping Plover at TRACEN Cape May

Source: Giumarro 1998

The adult male piping plovers arrive in March prior to the female, select beach habitats, and defend established territories against other males. When adult females arrive at the breeding grounds several weeks later, the males conduct elaborate courtship rituals including aerial displays of circles and figure eights, whistling songs, posturing with spread tail and wings, and a rapid drumming of their feet. Piping plovers are generally monogamous during a single breeding season, however adults tend to pick new mates each year or every other year. While males often select different mates in consecutive years, nest site tenacity is generally very strong among males. Nest sites are simple depressions or "scrapes" in the sand. During courtship, males will generally create numerous scrapes for the female to inspect. The average nest is about 6 to 8 cm in diameter, and is often lined with pebbles, shells, or driftwood to enhance the camouflage effect. The piping plover breeds mainly on gently sloping fore dunes and blow-out areas behind primary dunes of sandy coastal beaches, and on suitable dredge oil deposits along the Atlantic Coast.

Eggs are laid every second day and the average clutch size is four eggs with 3-egg clutches occurring most commonly in replacement clutches (laid if the first clutch is unsuccessful). The average number of young fledged per nesting pair usually is two or fewer. The precocial young hatch about 27 to 31 days after egg laying, and incubation is shared by both adults. Juveniles typically fly 18 days after fledging and acquire an adult plumage the following spring (NatureServe 2001). Figure 3-8 diagrams the breeding timeline of the piping plover in southern New Jersey.

There are a variety of reasons that piping plover populations have become threatened. Due to the nature of the bird's life history, it is particularly sensitive to growing human populations. While Figure 3-9 shows that nest failures are most common due to predation, flooding, and unknown abandonment, other nest failures occur due to human disturbance, inviable eggs, or unknown factors. These factors are the proximate causes of population declines, but the ultimate cause of the species decline is habitat destruction and modification due to human development along the open dunes and beach fronts.

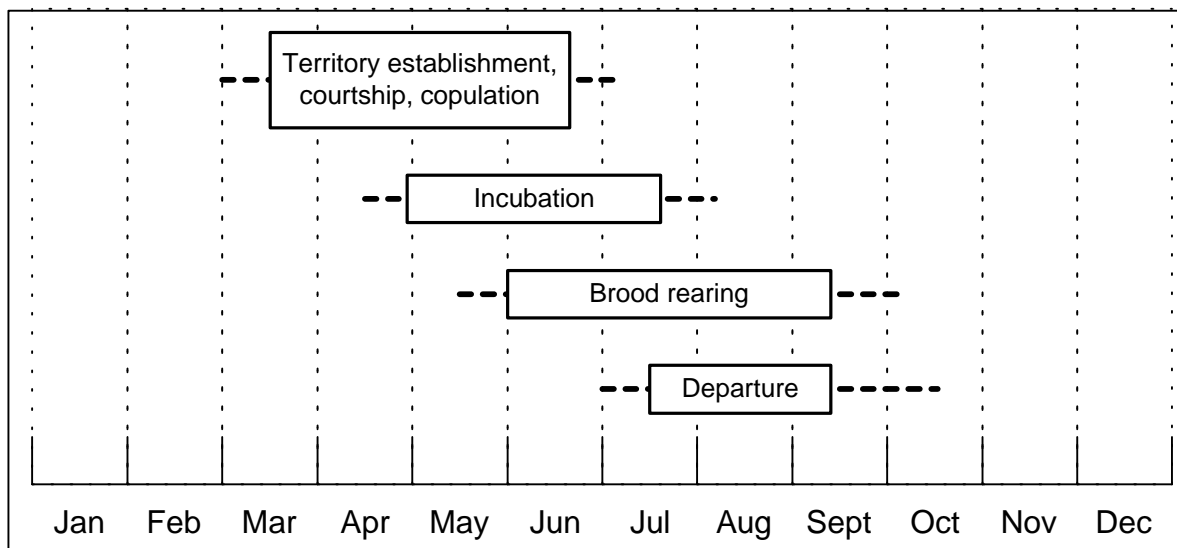
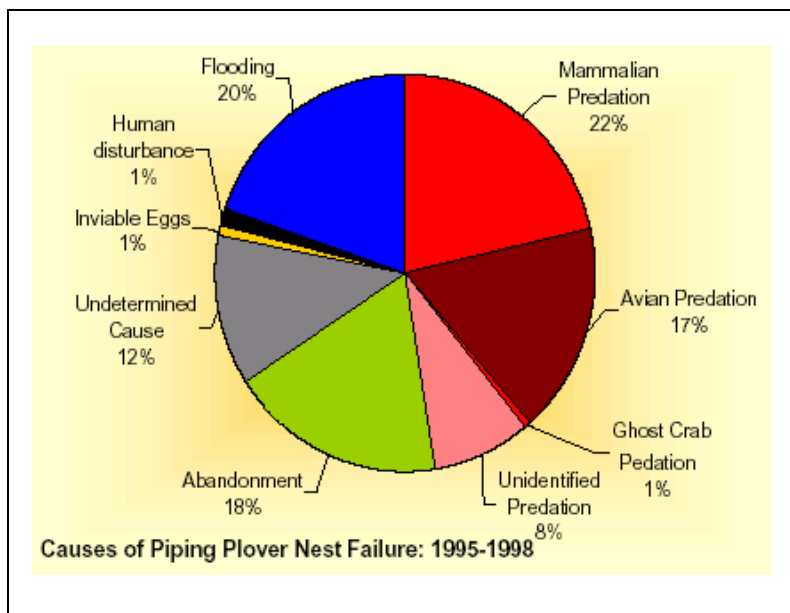


Figure 3-8. Breeding Timeline for the Piping Plover in Southern New Jersey



Source: NJDEP 1999

Figure 3-9. Causes of Piping Plover Nest Failure – 1995-1998

Least Tern (*Sterna antillarum*)

The least tern is a migratory bird (see Figure 3-10) that breeds on gravel/sand bars along rivers, channels, and streams. These 8 to 9 inch birds have a black "crown" on their head, a snowy white underside and forehead, grayish back and wings, orange legs, and a yellow bill with a black tip. From late April to August, terns use barren to sparsely vegetated sandbars along rivers, sand and gravel pits, or lake and reservoir shorelines. Least terns nest in small colonies in shallow holes scraped in an open sandy area, gravelly patch, or exposed flat. The nest is an inconspicuous, unlined scrape usually containing three brown spotted eggs. Egg laying and incubation occur from late May through early August.



Figure 3-10. Photograph of a Least Tern

Least terns usually forage close to the nesting colony. Incubation lasts about 21 days, after which the eggs begin to hatch on consecutive days. The newly hatched young are weak and helpless and are continuously brooded by the adults during the first day. Chick coloration varies from a grayish-brown to nearly reddish or sandy-brown with white under parts. Tiny black spots on the head and back complement the sand-colored camouflage plumage of the chicks. A day or two after hatching, the chicks begin to wander from the nest scrape and become increasingly mobile, but are periodically brooded by the adults until they can regulate their own body temperature. About three weeks after hatching, young terns are able to fly. The chicks leave the nest only a few days after hatching, but the adults continue to care for them, leading them to shelter in nearby grasses and bringing them food. Both adults catch small fish and young chicks are consistently brought non-spiny fish one-half to two inches long. The terns hover over and dive into standing or flowing water to catch small fish. Adults consume fish ranging in length between one and three inches. Adults and young birds swallow the fish whole, head first and usually in one gulp.

Seabeach Amaranth (*Amaranthus pumilus*)

Seabeach amaranth (Figure 3-11) has been documented in Monmouth County and Upper Township, Cape May County, New Jersey. Seabeach amaranth is an annual plant endemic to the Atlantic Coast beaches and barrier islands. The primary habitat of seabeach amaranth consists of overwash flats at accreting ends of islands, lower fore dunes, and upper strands of non-eroding beaches (landward of the wrackline), although the species occasionally establishes small temporary populations in other habitats, including sound-side beaches, blowouts in fore dunes, inter-dunal areas, and on sand and shell material deposited for beach replenishment or as dredge spoil. Seabeach amaranth usually is found growing on a nearly pure sand substrate, occasionally with shell fragments mixed in.

Seabeach amaranth occupies elevations from eight inches to five feet above mean high tide and is intolerant of even occasional flooding during its growing season of early June into late fall. The habitat of seabeach amaranth is sparsely vegetated with annual herbs and, less commonly,



Figure 3-11. Photograph of Seabeach Amaranth

perennial herbs (mostly grasses), and scattered shrubs. Vegetative associates of seabeach amaranth include sea rocket (*Cakile edentula*), seabeach spurge (*Chamaesyce polygonifolia*), and other species of open, sandy beach habitats. Seabeach amaranth is often associated with beaches managed for the protection of beach nesting birds such as the piping plover and least tern. Threats to seabeach amaranth include beach stabilization efforts (particularly the use of beach armoring, such as sea walls and riprap), intensive

recreational use, and herbivory by webworms. Seabeach amaranth is sensitive to trampling and crushing by pedestrian or vehicular traffic.

While this species has not been documented on the Installation, FWS feels that the species is expanding its range into new areas. Section 4 of this INRMP includes specific provisions which establish a seabeach amaranth monitoring program on the beaches of TRACEN Cape May in conjunction with the on-going endangered species management program.

3.3 MISSION RELATED NON-NATURAL RESOURCE AREAS

In view of the nature and scope of its mission, TRACEN Cape May poses a variety of potential impacts to the local environment. This section identifies and describes the nature of these impacts.

3.3.1 Hazardous Materials and Hazardous Wastes

TRACEN Cape May receives, uses, and stores quantities of hazardous materials, including flammable and combustible materials such as vehicle fuels. Additional hazardous materials used at this facility may include corrosives, acids, glycol (anti-freeze), aerosols, paints (latex), cleaning reagents, hydraulic fluids, and lubricants. The TRACEN has a hazard communication program to identify the risks associated with the use of these hazardous materials.

Hazardous waste generators are regulated under N.J.A.C. 7:26G-6 et seq. and 40 CFR 262 by incorporation. These regulations require the generator, depending on generator size, to:

- Obtain an USEPA generator identification number;
- Determine whether its waste is hazardous;
- Manage wastes appropriately during accumulation;
- Adhere to land disposal restrictions;
- Manifest waste shipments;

- Designate a transporter and a Treatment, Storage, and Disposal Facility (TSDF) that each possess an USEPA identification number;
- Prepare and implement a contingency plan (required for Large Quantity Generators);
- Perform record keeping and reporting requirements; and,
- Pay all applicable fees.

Hazardous wastes and materials management are also encompassed under Executive Order (EO) 12856, *Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements*. EO 12856 requires Federal facilities to report Toxics Release Inventories (TRI) releases and to set agency goals of reducing TRI reportable releases. Facility pollution prevention plans should include a detailed inventory of waste generation, an analysis of pollution prevention opportunities and options, and a plan for implementing pollution prevention measures. TRACEN Cape May utilizes the Pollution Prevention Plan (P2 Plan) for this purpose (TRACEN 1997). Environmental audits are conducted under the ECE Program as required by COMDTINST 16478.5. This program establishes policies, procedures, and responsibilities for compliance with environmental standards.

Fueling for equipment, vessels, or vehicles is conducted as needed at various locations on the Installation including the piers. TRACEN Cape May receives oil products, gasoline, and fuel oil via delivery truck, and stores the product in aboveground storage tanks (ASTs). These fueling operations occur in areas designed to contain any potentially released petroleum products. A current spill prevention, control, and countermeasure (SPCC) plan for TRACEN Cape May includes required actions to prevent release of fuel, such as daily inspections, and use of secondary containment structures. The SPCC Plan also details actions required to respond to a spill of petroleum products (TRACEN undated).

TRACEN Cape May is also required to maintain a Facility Response Plan (FRP) because it transfers oil over water to and from vessels and has a total oil storage capacity greater than 42,000 gallons. A current FRP, meeting the requirements of 40 CFR 112.20, contains an emergency response action plan detailing personnel, equipment, response capabilities, and responsibilities of personnel to respond to a spill of oil.

The cleanup and remediation required for potentially contaminated sites are governed by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the New Jersey Cleanup Responsibility Act. A voluntary remediation project at the Fire Training Area was recently completed. The site's soil and ground water was contaminated with petroleum products used during past fire fighting training exercises. The contaminated soils and groundwater was cleaned up in 2000. A no further action letter has been received from the NJDEP in 2001.

Hazardous Waste Management

Activities at TRACEN Cape May generate limited quantities of hazardous waste. Vehicle maintenance represents the primary activity producing hazardous wastes, mostly in the form of antifreeze, paints, and solvents. New Jersey does not regulate waste motor oils as a hazardous waste. TRACEN Cape May is a small quantity generator of hazardous waste, which is defined by the state as generating between over 1,000 kilograms of non-acute hazardous waste per month, or less than 6,000 kilograms at any point in time. Maintenance activities include collection of the waste oils and other materials in appropriate containers. Waste oil, anti-freeze, and waste oil

filters are transported off site for appropriate disposal. Daily inspections of drum storage locations are conducted by the Engineer-of-the-Watch (EOW).

Petroleum Storage Tanks

There are 22 active petroleum products storage tanks in use at TRACEN Cape May. All tanks are above ground and contain diesel fuel, No. 2 fuel oil, No. 6 fuel oil, used oil, or unleaded gasoline. All ASTs are visually inspected daily by the EOW. Each AST is provided with a means of secondary containment, either in the form of double-walled construction or placement in concrete containment structures. Inspections of ASTs are detailed in the SPCC Plan for the Installation. There are no underground storage tanks on TRACEN Cape May.

3.3.2 Water Quality

Surface water quality at TRACEN Cape May can be detrimentally affected by fuel or other hazardous material spills or leaks, air pollution sources, seepage from Installation Restoration Program (IRP) sites, and sediments from soil erosion. These pollutants can degrade water quality either through toxicity effects on organisms in the water or through ancillary effects, such as high biological oxygen demand (BOD) from increased microbial activity in the water or eutrophication due to excess nutrients loads (e.g., phosphorous or nitrogen). High BOD can result in fish kills and other damage to surface water ecology.

Fueling operations for vessels stationed at the Installation's piers are the greatest threat to surface water at TRACEN Cape May. Procedures and equipment detailed in the FRP reduce the threat. A spill of oily bilge water occurred on July 19, 2001. Less than five gallons of oily water was discharged to the water. As a result of this incident, training was conducted on the proper use of equipment at the site, and equipment used to hold oily bilge water during offloading operations is being retrofitted at the site.

The Water Quality Act of 1987 amended the Clean Water Act to include the regulation of stormwater discharges. In November 1990, the USEPA published its Phase I stormwater regulations that required large municipalities and specific industrial classes to be covered under a NPDES stormwater permit. USCG TRACEN Cape May is evaluating Phase II of the stormwater regulations to determine if these new regulations require the facility to obtain permits for the ten stormwater outfalls from the site.

3.3.3 Air Pollution

Air quality in a given location or region is generally described by the concentrations of various measurable substances known as "criteria pollutants." Concentrations are normally expressed in units of parts per million (ppm), milligrams per cubic meter (mg/m^3), or micrograms per cubic meter (ug/m^3). Air quality is determined by the type and amount of pollutants in the atmosphere, the size and topography of the air basin, and local and regional meteorological influences. The significance of a pollutant concentration is determined by comparison with Federal and/or state air quality standards. These standards represent the maximum allowable concentrations of various pollutants necessary to protect public health and welfare with a reasonable margin of safety.

Federal standards, as determined by the USEPA, are termed the National Ambient Air Quality Standards (NAAQS). These standards include maximum concentrations for ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter less than 10

microns in diameter (PM₁₀), and lead (Pb) (40 CFR 50). Recent amendments have added a standard for particulate matter less than 2.5 microns in diameter (PM_{2.5}) that will be implemented over a period of time. The standards are defined in terms of concentrations determined over various periods of time (averaging periods). Short-term standards (1-hour, 8-hour, or 24-hour) were established for pollutants with acute health effects, while long-term standards (annual) were established for pollutants with chronic health effects.

The Clean Air Act (CAA) allows states to adopt ambient air quality standards and other regulations, provided they are at least as stringent as Federal standards. NJDEP is the state's air quality regulatory authority. NJDEP has adopted all of the NAAQS, in addition to standards of its own. The additional pollutant regulated under NJDEP standards is Total Suspended Particulates (TSP). Table 3-8 summarizes the Federal and state standards associated with these pollutants.

The CAA and USEPA delegated responsibility for ensuring compliance with NAAQS to the states and local agencies. As such, each state must develop air pollutant control programs and must promulgate regulations and rules that focus on meeting NAAQS and maintaining healthy ambient air quality levels. These programs are detailed in State Implementation Plans (SIPs) that must be developed by each state and approved by the USEPA. A SIP is a compilation of regulations, strategies, schedules, and enforcement actions designed to move the state into compliance with all NAAQS. Any changes to the compliance schedule or plan (i.e., new regulations, emission budgets, controls, etc.) must be incorporated into the SIP and approved by the USEPA.

States or other agencies with non-attainment areas for one or more of the NAAQS may petition USEPA for redesignation as a "maintenance area" if they are able to demonstrate they have met the national standard for the three years preceding redesignation. At the time the state petitions USEPA for redesignation, it must also submit a revision of its SIP to provide for the maintenance of the applicable NAAQS for at least 10 years after redesignation ("maintenance plan") pursuant to CAA §175(A).

The CAA §176(c)(1) prohibits Federal agencies from undertaking projects that do not conform to a USEPA-approved SIP. In 1993, the USEPA developed the General Conformity Rule, which specifies how Federal agencies must determine CAA conformity for sources of non-attainment pollutants in designated non-attainment areas. This rule and all subsequent amendments may be found in the CFR at 40 CFR 51 Subpart W and 40 CFR 93 Subpart B. Through the Conformity Determination process specified in the final rule, any Federal agency must analyze increases in pollutant emissions directly or indirectly attributable to the Proposed Action, and may need to complete a formal evaluation that may include modeling for NAAQS impacts, obtaining a commitment from the state regulatory agency to modify the SIP to account for emissions from the proposed action, and/or provision for mitigation for any significant increases in non-attainment pollutants.

In 1997, USEPA initiated work on new General Conformity rules and guidance to reflect the new 8-hour ozone, PM_{2.5}, and regional haze standards that were promulgated in that year. However, because of the litigation and resulting delay in implementation of the new ozone and PM_{2.5} ambient air quality standards, these new conformity requirements have not been completed by USEPA, and no draft rule language is currently available (USEPA 2001).

The General Conformity Rule and the promulgated regulations found in 40 CFR Part 93, exempt certain Federal actions from conformity determinations (e.g., contaminated site clean-up and

Table 3-8. National and New Jersey Ambient Air Quality Standards

Pollutant	Standard	Averaging Period	New Jersey ^a	National ^b
Sulfur Dioxide	Primary	12-month arith. mean	80 µg/m ³ (0.03 ppm)	0.030 ppm
	Primary	24-hour average	365 µg/m ³ (0.14 ppm)	0.14 ppm ^c
	Secondary	12-month arith. mean	60 µg/m ³ (0.02 ppm)	---
	Secondary	24-hour average	260 µg/m ³ (0.10 ppm)	---
	Secondary	3-hour average	1300 µg/m ³ (0.5 ppm)	0.5 ppm ^c
Total Suspended Particulates	Primary	12-month geom. mean	75 µg/m ³	---
	Primary	24-hour average	260 µg/m ³	---
	Secondary	12-month geom. mean ^d	60 µg/m ³	---
	Secondary	24-hour average	150 µg/m ³	---
Inhalable Particulates	Prim. / Sec.	Annual arith. mean	---	50 µg/m ³
	Prim. / Sec.	24-hour average	---	150 µg/m ³
Fine Particulates	Prim. / Sec.	Annual arith. mean	---	15 µg/m ³
	Prim. / Sec.	24-hour average	---	65 µg/m ³
Carbon Monoxide	Prim. / Sec.	8-hour average	10 mg/m ³ (9 ppm)	9 ppm (10 mg/m ³) ^e
	Prim. / Sec.	1-hour average	40 mg/m ³ (35 ppm)	35 ppm (40 mg/m ³) ^e
Ozone	Prim. / Sec.	Max. Daily 1-hr. average	0.12 ppm (235 µg/m ³)	0.12 ppm (235 µg/m ³) ^f
	Prim. / Sec.	1-hour average	0.08 ppm (160 µg/m ³)	12 ppm (235 µg/m ³) ^f
Nitrogen Dioxide	Prim. / Sec.	12-month arith. mean	100 µg/m ³ (0.05 ppm)	0.053 ppm (100 µg/m ³)
Lead	Prim. / Sec.	3-month average	1.5 µg/m ³	---
	Prim. / Sec.	Quarterly Mean	---	1.5 µg/m ³

Notes: a. New Jersey short-term standards are not to be exceeded more than once in any 12-month period.

b. National short-term standards are not to be exceeded more than once in a calendar year.

c. National standards are block averages rather than moving averages.

d. Intended as a guideline for achieving short-term standard.

e. National secondary standards for carbon monoxide have been dropped.

f. Maximum daily 1-hour averages: averaged over a three year period the expected number of days above the standard must be less than or equal to one. This standard was replaced by an 8-hour average standard on September 18, 1997.

g. Standard is met when the 3-year average of the fourth highest daily maximum 8-hour average is less than or equal to 0.08 ppm. This new standard became effective September 18, 1997.

natural emergency response activities). Other Federal actions are assumed to be in conformity if total indirect and direct project emissions are below *de minimis* levels established under 40 CFR Part 93.153. The threshold levels (in tons of pollutant per year) depend upon the non-attainment status that the USEPA has assigned to a non-attainment area. Once the net change in non-attainment pollutants are calculated, the agency compares them to the *de minimis* thresholds. Section 4 of this document discusses the *de minimis* thresholds for each criteria pollutant and non-attainment area category.

Title V of the CAA Amendments of 1990 requires states to permit major stationary sources. A major stationary source is a facility (i.e., plant, base, or activity) that has the potential to emit

more than 100 tons annually of any one criteria air pollutant, 10 tons per year of a hazardous air pollutant, or 25 tons per year of any combination of hazardous air pollutants. The purpose of the permitting rule is to establish regulatory control over large, industrial-type activities and to monitor their impact upon air quality.

Federal Prevention of Significant Deterioration (PSD) regulations also define air pollutant emissions from proposed major stationary sources or modifications to be “significant” if: 1) a proposed project is within 10 kilometers of any Class I area; and 2) regulated pollutant emissions would cause an increase in the 24-hour average concentration of any regulated pollutant in the Class I area of $1 \mu\text{g}/\text{m}^3$ or more [40 CFR 52.21(b)(23)(iii)]. PSD regulations also define ambient air increments – limiting the allowable increases to any area’s baseline air contaminant concentrations, based on the area’s designation as Class I, II, or III [40 CFR 52.21(c)].

Attainment Status

Among the provisions of the CAA is the requirement that areas with ozone concentrations above certain levels demonstrate that their plans will meet the health standard within the time frame required by the CAA. New Jersey is required to make such a demonstration for the eighteen of its twenty-one counties that have not been designated as in attainment with the NAAQS for ozone. These counties are associated with two multi-state non-attainment areas which are designated the Philadelphia-Wilmington-Trenton Non-attainment Area and the New York-Northern New Jersey-Long Island Non-attainment Area. USCG TRACEN Cape May does not fall within these non-attainment areas and remains in attainment with all additional air quality standards.

3.3.4 Socioeconomics and Environmental Justice

Socioeconomics are defined as the basic attributes and resources associated with the human environment, particularly population and economic activity. Regional birth and death rates and immigration and emigration affect population levels. Economic activity typically encompasses employment, personal income, and industrial or commercial growth. Changes in these two fundamental socioeconomic indicators may be accompanied by changes in other components such as housing availability and the provision of public services. Socioeconomic data at county, state, and national levels permits characterization of baseline conditions in the context of regional, state, and national trends.

On February 11, 1994, President Clinton issued EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. This EO requires that Federal agencies’ actions substantially affecting human health or the environment do not exclude persons, deny persons benefits, or subject persons to discrimination because of their race, color, or national origin. The essential purpose of the EO is to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no groups of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, tribal, and local programs and policies. Consideration of environmental justice concerns includes race, ethnicity, and the poverty status of populations in the vicinity of where a proposed action would occur. Such information aids in evaluating whether a proposed action would render vulnerable any of the groups targeted for protection in the EO.

Ethnicity and poverty status in the region surrounding TRACEN Cape May have been examined and compared to state and national statistics to determine if the implementation of the INRMP could disproportionately affect minority or low-income groups. The Census Bureau bases the poverty status of families and individuals on threshold variables, including income, family size, number of family members under 18 and over 65 years of age, and amount spent on food. In 1990, the U.S. poverty threshold was \$11,821 for a family of three and 13.12 percent of the U.S. population was below the poverty level. Based on the 1990 U.S. Bureau of Census data (see Table 3-9), residents in Cape May County have a higher poverty level than the State of New Jersey poverty level but a lower poverty level than the national level.

Table 3-9. Race and Poverty Characteristics

	United States	New Jersey	Cape May Co., NJ
Total Population	281,421,906	8,414,350	102,326
Percent White	75.1	72.6	91.6
Percent Black	12.3	13.6	5.1
Percent American Indian, Eskimo, or Aleut	0.9	0.2	0.2
Percent Asian or Pacific Islander	3.7	5.8	0.7
Percent Other	5.5	5.4	1.3
Percent reporting two or more races	2.4	2.5	1.2
Percent Living in Poverty*	13.1	7.6	8.3

Note: * Poverty data reflects U.S. Bureau of Census 1990 data

Sources: U.S. Bureau of Census 2000

U.S. Bureau of Census 1990

3.4 KNOWN FUTURE MISSION IMPACTS

There are no known mission changes anticipated at TRACEN Cape May during the life cycle of this INRMP (i.e., the next five years). However, construction of new buildings and facilities will continue on TRACEN Cape May in support of its current missions and demands of modernization. The discrete and cumulative impacts on the local environment must continually be evaluated.

4. MANAGEMENT CONCERNS, GOALS, AND OBJECTIVES

Ecosystem management must be based on clearly stated goals and objectives. This INRMP identifies goals and objectives, and presents the means to accomplish them, as well as the methodologies to monitor results. This INRMP is the mechanism through which both ecosystem management and biodiversity conservation will be accomplished on TRACEN Cape May in agreement with the successful accomplishment of the Installation's operational mission.

Management objectives established in this INRMP were developed through a thorough evaluation of the natural resources present on TRACEN Cape May. In accordance with COMDTINST M5090.3 and the principles of adaptive ecosystem management, subject areas were identified and management alternatives developed by an interdisciplinary team of ecologists, biologists, geologists, planners, and environmental scientists. This section presents the preferred management alternatives based on the professional opinions of TRACEN Cape May Environmental Protection and Safety Section, FWS, NJDEP Division of Fish and Wildlife, and the TRACEN Cape May INRMP Focus Group. Through these evaluations, a set of natural resources planning and management goals have been established that represent the most current theories on adaptive ecosystem-based planning (see Table 4-1). Selection of these management goals have been tempered with the fact that the operational mission at TRACEN Cape May takes primacy over natural resources management. However, through the multiple-use adaptive paradigms used, sound ecological management on the Installation should supplement the operational effectiveness and safety of the missions. Ecosystem management provides a means for the USCG to both conserve biodiversity and to provide high quality recruit training. This INRMP is a mechanism through which TRACEN Cape May can maintain sustainable land use through ecosystem management.

Table 4-1. Summary of INRMP Goals

Ecosystem Management Goals
<ul style="list-style-type: none"> • Manage the Installation based on regional ecosystem approach that conserves biodiversity. • Identify natural resources and operational actions that compromise the function and composition of ecosystems and develop remedies through adaptive management. • Implement management strategies with consideration of ecological units and time frames. • Support sustainable, multiple-use human activities. • Apply ecosystem-based management through implementation of INRMP and other Installation plans and programs. • Manage ecosystems using broad based ecological themes that include operational and social requirements. • Reduce man-induced ecosystem stressors such as air pollution, water pollution, etc. to ensure proper ecosystem function.
Off-Base Management Goals
<ul style="list-style-type: none"> • Coordinate with surrounding land-owners on ecosystem-based management of resources and encourage cooperative efforts on adjacent lands that are complementary to the INRMP. • Minimize threats to TRACEN Cape May natural resources from off-base land use.

Table 4-1. Summary of INRMP Goals (continued)

Threatened and Endangered Species Protection Management Goals
<ul style="list-style-type: none"> • Manage TRACEN Cape May on a regional ecosystem-based approach that manages sensitive species and their associated ecosystems while protecting the operational functionality of the mission. • Ensure that TRACEN Cape May remains in compliance with ESA and appropriate state regulations. • Promote natural resources and ecosystem management in the local region that benefits the functionality of TRACEN Cape May ecosystems. • Protect sensitive wildlife habitats on the Installation.
Wetlands and Floodplains Management Goals
<ul style="list-style-type: none"> • Remain in compliance with USACE and NJDEP wetlands regulations. • Minimize the operational impact of TRACEN Cape May missions on wetlands and floodplains. • Maintain healthy, functional wetlands that can sustain minor operational influences and minor, inadvertent encroachments. • Enhance wetland functionality to maximize societal-based wetland values within local ecosystems. • Maximize floral and faunal diversity of wetland communities in areas that will not affect the mission. • Manage for no net loss of wetland and floodplain acreage, functions, and values.
Coastal Zone Management Goals
<ul style="list-style-type: none"> • Ensure that the future maintenance of the Installation's coastal zone resources is performed in a manner that supports shoreline stabilization and the reduction of erosion and sedimentation into Delaware Bay, without compromising the mission. • Ensure that any USCG action that have reasonably foreseeable effect on any land or water use or natural resource of the coastal zone be consistent with the enforceable policies of the State's federally approved Coastal Management Program. • Work with Federal, State, and local interests in preserving the shores of the Atlantic Coast through unifying policies, criteria, standards, methods, and processes for dealing with land and water use decisions of more than local significance. • Ensure that future maintenance of the Installation's coastal zone resources is performed in a manner that supports the diverse biological and hydrological functions unique and significant to coastal zones. • Reduce/control nutrient and sediment inputs into the watershed that degrades water quality. • Minimize non-point source pollution of both surface and groundwater in the watershed through the implementation of best management practices. • Maintain vegetation buffers along dunes.
Wildlife and Fisheries Management Goals
<ul style="list-style-type: none"> • Manage based on an ecosystem management approach, rather from a single species paradigm. • Employ a systematic approach to managing wildlife resources, utilizing a process that includes inventory, monitoring, modeling, management, assessment, and evaluation.

Table 4-1. Summary of INRMP Goals (continued)

<ul style="list-style-type: none"> • Minimize wildlife-related health risks, safety risks, and environmental damage. • Restore and maintain a diversity of wildlife in areas on the Installation where there will be no conflict with the mission. • Continue to remain in compliance with federal, state, and local laws and regulations governing fish and wildlife. • Maintain and involve partnerships with agencies and groups involved in wildlife management.
Grounds Maintenance and Land Management Goals
<ul style="list-style-type: none"> • Lessen or avoid adverse effects from project activities to the overall ecosystem and its sensitive resources. • Make maximum use of regionally native plant species and avoid introduction of invasive, exotic species in re-vegetation and landscaping activities. • Reduce chemical usage, and maintenance inputs in terms of energy, water, manpower, equipment, and chemicals. • Ensure compliance with environmental legislation, regulations, and guidelines. • Control pest and invasive species on the Installation.
Urban Forestry Goals
<ul style="list-style-type: none"> • Ensure the orderly and scientific management of the urban trees on the Installation to the extent compatible and consistent with the missions of the USCG and TRACEN Cape May. • Protect the real estate investment of the U.S. Government from unnecessary depreciation and/or depletion of urban forestry resources.
Outdoor Recreation Management Goals
<ul style="list-style-type: none"> • Provide quality outdoor recreation experiences while sustaining ecosystem integrity. • Ensure that outdoor recreation activities are not in conflict with mission or natural resources priorities.
GIS Management Goals
<ul style="list-style-type: none"> • Acquire GIS and train personnel on its use. • Collect, store, and maintain data about historical conditions, trends, and current status for critical indicators of ecological integrity and sustainability. • Use GIS information as benchmarks for developing future natural resources management goals and objectives.

Specific “management issues” have been identified in a number of subject areas that affect the natural resources present on and immediately adjacent to TRACEN Cape May. The purpose of this section is to identify actions and objectives for TRACEN Cape May to obtain workable and useful solutions for each management issue identified. This section is divided into 11 subsections, one for each subject area. For simplicity and clarity within this INRMP, each natural resource topic is assigned an individual “issue number.” Each subject area has been abbreviated, as shown in Table 4-2. For example, the first management issue in Section 4.4, Wetlands Floodplains, is identified as WT-1. In addition, a series of actions are presented following the goal and objective for each management issue. These actions are consecutively numbered for each management issue. Following the management actions are the evaluation criteria, which is

used to track the status of the resolution of the management issue. A summary of the management actions is provided in Section 5, *INRMP Implementation*.

Table 4-2. INRMP Subject Area Abbreviations

INRMP Subject Area		Abbreviation
4.1	Ecosystem Management	EM
4.2	Off-Base Land Use	OB
4.3	Threatened or Endangered Species	TE
4.4	Wetlands and Floodplains	WT
4.5	Coastal Zone Management	CZM
4.6	Fish and Wildlife Management	FWM
4.7	Grounds Maintenance and Land Management	GM
4.8	Urban Forestry	FOR
4.9	Outdoor Recreation and Beach Access	OR/BA
4.10	Geographic Information Systems	GIS
4.11	Natural Resources Constraints to Installation Planning and Missions	NC

Some of the projects described in this section will be accomplished through interactive partnerships with other federal, state, and local organizations. TRACEN Cape May Environmental Protection and Safety staff initiates partnerships based on the benefits to the regional ecosystem and the local environment. Required projects, which are part of the continued management of TRACEN Cape May, will be internally funded through the USCG.

4.1 ECOSYSTEM MANAGEMENT

The guiding philosophy of this INRMP is to take an ecosystems approach to managing the natural resources present on TRACEN Cape May. The interdisciplinary approach taken by this INRMP follows an ecosystems model, in which all appropriate components are integrated by their function. This section addresses TRACEN Cape May's goal of being a leader in facility and natural resource management within the USCG. One of TRACEN Cape May's Strategic Plan (TRACEN.05-2) goals is: "through occupant ownership and deliberate stewardship, we will continually upgrade the functionality, maintenance and appearance of our land and facilities". The approach of this INRMP and the ecosystem is one of the mechanisms by which TRACEN Cape May meets this goal.

Ecosystem management is emphasized because it is recognized that the mission of the USCG is inextricably linked to local, regional, and global ecological integrity. Sustaining ecosystem integrity is also the best way to protect biodiversity, ensure sustainable use, and minimize the effort and cost of management. Native and natural communities, and the processes that sustain them, are unique expressions of the evolutionary and geological histories that are essential to sustaining current system function and resilience. While habitat with the potential to dramatically alter ecosystem form and function is limited at TRACEN Cape May, it is still a priority of this Installation to manage according to this paradigm.

Ecosystem-based management also must consider human functions and needs within the foundation of establishing natural resources management actions. A useful perspective in modeling ecological and social needs together into this INRMP is through the application of an ecological economics perspective. Ecological economics (EE) is not traditional natural resource and environmental economics (Costanza 1997). EE is a departure from the traditional ways that ecologists, land managers, and economists have considered the economic and ecological needs of a particular system by thinking about economic and ecological theory together from an interdisciplinary perspective. In the case of the USCG, the EE perspective can be applied to better understand the operational, social, and ecological requirements at unit locations. This INRMP brings together some of the insight from economic thought and operational necessity with the insight of ecology to present a more clear perspective on the relationship between USCG operations, crew morale, community responsibilities, and ecological functions and the interactions which bind them.

This EE perspective can be applied to merge the needs of the operational mission and the social environment of TRACEN Cape May with the ecological functions of the Installation and the region. From this perspective, six central themes have been developed to guide the ecological management perspective used in formulating the goals, objectives, and management actions in this INRMP. EE themes included in the development of the natural resources management actions include: sustainability, broad ecological values, uncertainty, multiple methodologies, cooperative efforts, and land ethic. These central themes are summarized in Table 4-3.

Ecosystems provide services which are of utility to wildlife, plants, and humans. Healthy ecosystem functions are often viewed separately from human communities; however human society is inextricably linked to ecosystem structures and functions. For example, regulation of hydrological flow is beneficial to human communities to provide drinking water, irrigation, or industrial applications which drive our society. A list of the ecosystem services and the function which they provide is listed in Table 4-4.

As described in Table 4-5, the goal of ecosystem management at TRACEN Cape May is to conserve biodiversity by managing the ecosystem rather than focusing on a single biotic or abiotic component of the ecosystem. Ecosystem-focused management at TRACEN Cape May encompasses both the function and the structure of the ecosystem and the processes that link them. The ecosystem management topics of concern and associated goals and objectives are listed in the following subsections.

Table 4-3. Ecological Themes used to Integrate Operational and Social Requirements

Ecological Theme	Description
Sustainability	Traditional economic analysis focuses on the goals of efficiency and growth. The integrity and sustainability of the ecosystem are essential for future operational success. The criterion of sustainability should be built into all USCG instructions and policies.
Broad Ecological Values	Economic value is limited to two narrow types: Value in exchange (market price) and value in use (willingness to pay or willingness to accept compensation). These types of values have often been applied when considering ecological functions. Instead, a much broader set of values including social, aesthetic, life support, intrinsic, and operational values must be associated with ecological functions.
Uncertainty	There are fundamental uncertainties and high levels of risk surrounding large scale or irreversible changes in the environment. For example, we don't know, with any precision, what the future impacts of increased concentrations of greenhouse gases in the atmosphere will be. In the face of such uncertainty, the prudent course is to proceed with caution. <i>"One does not run blindly through a dark landscape that may contain crevasses. One assumes they are there and goes gingerly and with eyes wide open, at least until one can see a little better" (Costanza 1989).</i>
Multiple Methodologies	Sole reliance on any one analytical framework or method would provide an incomplete picture of the relationships between ecosystems and requirements of the operational mission.
Cooperative Efforts	Cooperation among various shareholders in an ecosystem is necessary to the fragmented ownership patterns throughout an ecosystem. Partnerships with landowners outside of the Installation boundary in order to discuss management of the ecosystem that incorporates the requirements of the goals and missions of the various landowners or communities.
Land Ethic	Traditional economics and natural resources planning relied heavily on utilitarian approaches in analyses. This INRMP uses a land ethic as one of the fundamental underpinnings of the management prescribed.

Table 4-4. Ecosystem Services and Functions

Ecosystem Service	Ecosystem Functions	Examples of Benefits
Gas regulation	Regulation of atmospheric chemical composition.	CO ₂ /O ₂ balance, O ₃ for ultra violet light protection and SO _x levels
Climate regulation	Regulation of global temperature, precipitation, and other biological mediated climatic processes at global or local levels.	Greenhouse gas regulations, dimethyl sulphide (DMS) production affecting cloud formation.

Table 4-4. Ecosystem Services and Functions (continued)

Ecosystem Service	Ecosystem Functions	Examples of Benefits
Disturbance regulation	Capacitance, damping, and integrity of ecosystem response to environmental fluctuations.	Storm protection, flood control, drought recovery and other aspects of habitat response to environment variability mainly controlled by vegetation structure.
Water regulation	Regulation of hydrological flows.	Provisioning of water for agricultural (e.g., irrigation) or industrial (e.g., milling) processes or transportation.
Water supply	Storage and retention of water.	Provisioning of water by watersheds, reservoirs, and aquifers.
Erosion control & sediment retention	Retention of soil within an ecosystem.	Prevention of loss of soil by wind, runoff, or other removal processes, storage of silt in lakes and wetlands.
Soil formation	Soil formation processes.	Weathering of rock and the accumulation of organic material.
Nutrient cycling	Storage, internal cycling, processing and acquisition of nutrients.	Nitrogen fixation and other elemental or nutrient cycles.
Waste treatment	Recovery of mobile nutrients and removal or breakdown of excess nutrients and compounds.	Waste treatment, pollution control, and detoxification.
Pollination	Movement of floral gametes.	Provisioning of pollinators for the reproduction of plant populations.
Biological control	Trophic-dynamic regulations of populations.	Keystone predator control of prey species and reduction of herbivory by top predators.
Refugia	Habitat for resident and transient populations.	Nurseries, habitat for migratory species or regional habitats for locally harvested species or overwintering grounds.
Food production	That portion of gross primary production extractable as food.	Production of fish, game, crops, nuts, fruits by hunting, gathering, subsistence farming, or fishing.
Raw materials	That portion of gross primary production extractable as raw materials.	The production of lumber, fuel, or fodder.
Genetic resources	Sources of unique biological materials and products.	Medicine, products for materials science, genes of resistance to plant pathogens and crop pests, and ornamental species.
Recreation	Providing opportunities for recreational activities.	Ecotourism, sport fishing, and other outdoor recreational activities.
Cultural	Providing opportunities for non-commercial uses.	Aesthetic, artistic, educational, spiritual, and/or scientific values of ecosystems.

Source: (Costanza, *et al.* 1997)

Table 4-5. Ecosystem Management Goals

Ecosystem Management Goals
<ul style="list-style-type: none"> • Manage the Installation based on regional ecosystem approach that conserves biodiversity. • Identify natural resources and operational actions that compromise the function and composition of ecosystems and develop remedies through adaptive management. • Implement management strategies with consideration of ecological units and time frames. • Support sustainable, multiple-use human activities. • Apply ecosystem-based management through implementation of INRMP and other Installation plans and programs. • Manage ecosystems using broad based ecological themes that include operational and social requirements. • Reduce man-induced ecosystem stressors such as air pollution, water pollution, etc. to ensure proper ecosystem function.

4.1.1 EM-1: Impact on Air Quality From Conversion of the Centralized Heating Plant

- **Concern:** USCG TRACEN currently is converting the centralized heating plant that has the potential to emit (PTE) over 1000 tons of air emissions per year. However, the decentralization of the heating plant will decrease the PTE of TRACEN Cape May by 99% and the actual emissions by 90% to 95%. This will change the Title V status of the installation to a synthetic minor to possibly an actual minor by the completion of the project.
- **Objective:** Continue to minimize pollutants that have the potential to impact air quality and ultimately affect ecosystem processes.
- **Actions:** 1. Continue to track the pollutant output of the various decentralized heating plants.
- **Monitoring Criteria:** Continued evaluation of air quality will constitute monitoring criteria for this concern.

4.1.2 EM-2: Communication of Ecosystem Management Philosophy to TRACEN Cape May Personnel and Visiting Units

- **Concern:** TRACEN Cape May personnel require the appropriate guidance on an ecosystem management approach to natural resources management.
- **Objective:** TRACEN Cape May INRMP Working Group will promote discussion with Installation Command, personnel, and pertinent stakeholders about incorporating ecosystem management philosophy into command decisions and natural resources planning. Part of this process should include education of Installation personnel in established ecosystem management goals and objectives.

- **Actions:** 1. Appropriate TRACEN Cape May personnel need to be informed of the ecosystem management objectives established by the Environmental Protection and Safety Section.

2. Include ecosystem management justification in direction provided by the Environmental Protection and Safety Section on all land management projects.

3. Develop educational materials that describe ecosystem management, natural resources, and operational policies for use in training visiting units.
- **Monitoring Criteria:** Evaluation of communication among TRACEN Cape May personnel, pertinent stakeholders, and tenant units.

4.1.3 EM-3: Evaluation of Ecosystem Stressors

- **Concern:** Ecosystem management goals are established by prioritizing stressors on the ecological system and initiating specific management goals in the form of fish and wildlife management actions, watershed protection actions, etc. Additional topics of concern will be raised during the yearly review of this INRMP and at the five-year rewrite. By continually evaluating the ecosystem stressors, identification of areas in which TRACEN Cape May can improve ecosystem health can be initiated. This information is useful in identifying topics of concern that are based on an ecosystems approach.
- **Objective:** Implement an approach to continually evaluate ecosystem stressors on TRACEN Cape May.
- **Action:** 1. Develop a tool that evaluates the stressors on ecosystem health. An evaluation matrix is commonly used to evaluate the stressors on ecosystem function and the sources of stress. An example of an ecosystem stressor matrix is presented in Figure 4-1 and included as an electronic spreadsheet on the INRMP CD. This matrix identifies ecological stressors/stressor sources TRACEN Cape May and in the immediate proximity.
- **Monitoring Criteria:** Criteria for evaluation of ecosystem stressors are included in the ecosystem stressors matrix. Elimination of the sources of the various ecosystem stressors is an indication of progress toward successful ecosystem management.

4.2 OFF-BASE LAND USE

Off-Base land use has the potential to directly affect Installation plans, programs, and activities. Off-Base management by adjacent landowners (i.e., private landowners and the City of Cape May) needs to be considered in the application of the management actions identified in this INRMP. Off-Base development has the potential to affect the natural resources or mission priorities discussed in this INRMP due to disturbances to the Sensitive Species LMU during the breeding season.

As summarized in Table 4-6, the goal for this section is to manage TRACEN Cape May on a regional ecosystem-based approach that conserves biodiversity while protecting the operational

functionality of the missions of the Installation from natural resource related infringement. To attempt to meet this goal, the following management issues have been identified and objectives, actions, and monitoring criteria have been developed.

Table 4-6. Off-Base Management Goals

Off-Base Management Goals
<ul style="list-style-type: none"> • Coordinate with surrounding land-owners on ecosystem-based management of resources and encourage cooperative efforts on adjacent lands that are complementary to the INRMP. • Minimize threats to TRACEN Cape May natural resources from off-base land use.

4.2.1 OB-1: Unauthorized Access to the Beach

- **Concern:** There is minor problem of unauthorized access to the Installation via Cape May Beach access into the Sensitive Species LMU. Signage, as shown in Figure 4-2, and fencing is present on the southwest beach access, but during low tide, the signs are far away from the low water line and can not be seen. Signs can not be posted at the low tide mark, as they tend to wash away. Not only is the beach area managed as the Sensitive Species LMU, it also represents an area that poses a potential security risk in that individuals could potentially gain access to the Installation. Additional signage posted has reduced trespass, but controlling this area remains problematic.
- **Objective:** Minimize the potential for unauthorized access onto USCG property.
- **Actions:**
 1. Maintain contact with local and state law enforcement officials regarding efforts to control pedestrian traffic along the beach. NJDFW personnel continually escort people off of the beach.
 2. Provide weekly email briefing to security personnel to provide them with information on the status of the shorebird nesting and to gather information from the security force regarding unauthorized trespass onto the beach.
 3. Develop educational information, in addition to signs that are currently posted, that notify adjacent landowners, as well as recreationalists utilizing adjacent areas, of the reasons to maintain the Sensitive Species LMU as a controlled area. Permanent signage should also be maintained that describes the need to keep the beach closed and presents identification on the piping plover, least terns, and black skimmers nesting on the beach.
 4. Distribute the educational materials that describe need to maintain this area for USCG safety and for protection of the nesting shorebirds. Materials should be distributed in person to local residents rather than conducting mailings. This facilitates building of lasting relationships. Public access to beaches along the Atlantic Coast will continue to gain prominence as an issue in the future.
 5. If trespass becomes problematic, erect additional plastic signage at the western boundary of the perimeter that notifies violators of the legal ramifications of trespassing on Government property.

Stressor Type	Stressor Sub-Type	Stress Name	Source																										
			Agriculture	Silviculture/forestry	Mineral extraction	Development	Industrial	Industrial right of way	Roadways	Ditching/diking	Undetermined land use	Change of waterway	Drainage alteration	Impoundment	Erosion/sedimentation	Non-point pollution	Other point source pollution	Atmospheric deposition	Climate alteration	Scientific use of species	Species management	Exotic species	Native species	Pest control	Recreational use	Adjacent land use	Other specific activity		
1. Physical Habitat Alteration	0. Details unknown	1. Altered aquatic conditions	0. Not applicable																										
			0. Details unknown																										
			1. Altered channel																										
			2. Altered bed sediment loading																										
	2. Fire regime alteration	0. Details unknown	1. Complete fire suppression																										
			2. Other fire regime alteration																										
			0. Details unknown																										
			1. Removal or destruction																										
	3. Other physical alteration	0. Details unknown	2. Fragmentation																										
			3. Damage																										
2. System Chemistry Alteration	0. Details unknown	1. Altered water chemistry	4. Food supply or food web change																										
			5. Other specific physical alteration																										
			0. Not applicable																										
			0. Details unknown																										
	2. Altered air or ground chemistry	0. Details unknown	1. Altered dissolved oxygen regime																										
			2. Altered nutrient input regime																										
			3. Altered organic matter input regime																										
			4. Altered pH regime																										
	3. Anthropogenic biocides	0. Details unknown	5. Altered salinity regime																										
			6. Altered turbidity or suspended solids loads																										
7. Altered water temperature regime																													
0. Details unknown																													
3. Organism stressors	2. Altered air or ground chemistry	0. Details unknown	1. Altered particulate input regime																										
			2. Altered nutrient input regime																										
			3. Altered organic matter input regime																										
			4. Altered pH regime																										
	4. Other specific toxin anthropogenic	0. Details unknown	5. Other specific air/ground chemistry change																										
			1. Herbicides																										
			2. Fungicides																										
			3. Insecticides																										
	5. Other system chemistry alteration	0. Details unknown	4. Rodenticides																										
			5. Other anthropogenic biocide																										
0. Details unknown																													
1. Halogens & halides																													
4. Other stressor	0. Details unknown	1. Non-lethal stress	2. Metals																										
			3. Petroleum hydrocarbons																										
			4. Other hydrocarbons																										
			5. Mixture of specific anthropogenic toxins																										
	1. Other specific stressor	0. Details unknown	6. Other specific anthropogenic toxin																										
			0. Details unknown																										
			1. Altered radiation exposure																										
			2. Other specific system chemistry change																										
	2. Lethal stress	0. Details unknown	0. Not applicable																										
			0. Details unknown																										
1. Altered inter- or intraspecific competition																													
2. Complications due to small populations																													
5. Other stressor	0. Details unknown	1. Predation	3. Genetic alteration																										
			4. Parasitism																										
			5. Infectious disease																										
			0. Details unknown																										
	1. Other specific stressor	0. Details unknown	1. Predation																										
			2. Vertebrate animal damage control																										
			3. Other legal killing or removal																										
			4. Poaching, vandalism, harassment																										
	2. Other specific multiple stressors	0. Details unknown	5. Unintentional killing or removal																										
			6. Infectious disease																										
0. Other specific organism stressor																													
0. Not applicable																													
6. Other stressor	0. Details unknown	1. Other specific stressor	0. Details unknown																										
			1. Other specific single stressor																										
			2. Other specific multiple stressors																										
			0. Details unknown																										
	1. Other specific stressor	0. Details unknown	1. Other specific single stressor																										
			2. Other specific multiple stressors																										
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	2. Other specific multiple stressors	0. Details unknown	1. Other specific single stressor																										
			2. Other specific multiple stressors																										
0. Details unknown																													
1. Other specific single stressor																													

Note: Adapted from Braun (1995)

Figure 4-1. Ecosystem Stressors Matrix at TRACEN Cape May



Figure 4-2. Photograph of Signage at Western Perimeter of Beach

6. Establish and maintain a log in Appendix I of this INRMP to document the occurrences of unauthorized access onto Sensitive Species LMU by the public or by unit/tenant personnel.
- **Monitoring Criteria:** Annually review the Unauthorized Beach Access log in Appendix I of this INRMP to gauge effectiveness of the management actions designed to prevent unauthorized access onto the beach area. Implement controls to further protect this area should the number of violations warrant it.

4.3 THREATENED OR ENDANGERED SPECIES

As previously described in Section 3.2.9, the FWS and NJDFW were contacted regarding the presence of threatened and endangered species in the geographic area of TRACEN Cape May pursuant to the requirements of Section 7(c) of the Endangered Species Act (16 U.S.C. 1536). Communications with these agencies has led to the compilation of the federally and state-listed plants and animals on or adjacent to TRACEN Cape May listed in Table 4-7.

Table 4-7. Federally and State-Listed Threatened and Endangered Species Documented on or in the Immediate Area of TRACEN Cape May

Common Name	Scientific Name	Federal Status	State Status
BIRDS			
Piping plover*	<i>Charadrius melodus</i>	T	E
Least tern*	<i>Sterna antillarum</i>		E
Black skimmer*	<i>Rynchops niger</i>		E
Bald eagle	<i>Haliaeetus leucocephalus</i>	T	E
Roseate tern	<i>Sterna dougallii</i>	E	
Black-crowned night-heron	<i>Nycticorax nycticorax</i>		T
Yellow-crowned night-heron	<i>Nyctanassa violacea</i>		T
VASCULAR PLANTS			
Seabeach amaranth	<i>Amaranthus pumilus</i>	T	

Source: FWS 2002, NJNHP 2002

Notes: * Documented as breeding at TRACEN Cape May

E – Federally or state-listed endangered species

T – Federally or state-listed threatened species

As summarized in Table 4-8, the goal for this section is to manage TRACEN Cape May on a regional ecosystem-based approach that manages sensitive species while protecting the operational functionality of the mission. While single species management is not promoted on as a general philosophical management approach on the Installation, specific controls are used to protect threatened and endangered species beyond management of the ecosystem. These procedures center around predator exclosures for piping plovers. Other procedures in place for management of threatened and endangered species are targeted on making modification to the ecosystem and human interactions within this environment.

Table 4-8. Summary of Threatened and Endangered Species Management Goals

Threatened and Endangered Species Management Goals
<ul style="list-style-type: none"> • Manage TRACEN Cape May on a regional ecosystem-based approach that manages sensitive species and their associated ecosystems while protecting the operational functionality of the mission. • Ensure that TRACEN Cape May remains in compliance with ESA and appropriate state regulations. • Promote natural resources and ecosystem management in the local region that benefits the functionality of TRACEN Cape May ecosystems. • Protect sensitive wildlife habitats on the Installation.

Figure 4-3 presents an endangered species coordination decision chart that will be followed as part of the planning process for projects that will impact known or potential future populations of threatened or endangered species on the TRACEN Cape May. All major federal actions conducted by TRACEN Cape May will follow this process to determine if consultation with FWS (either formal or informal) is necessary.

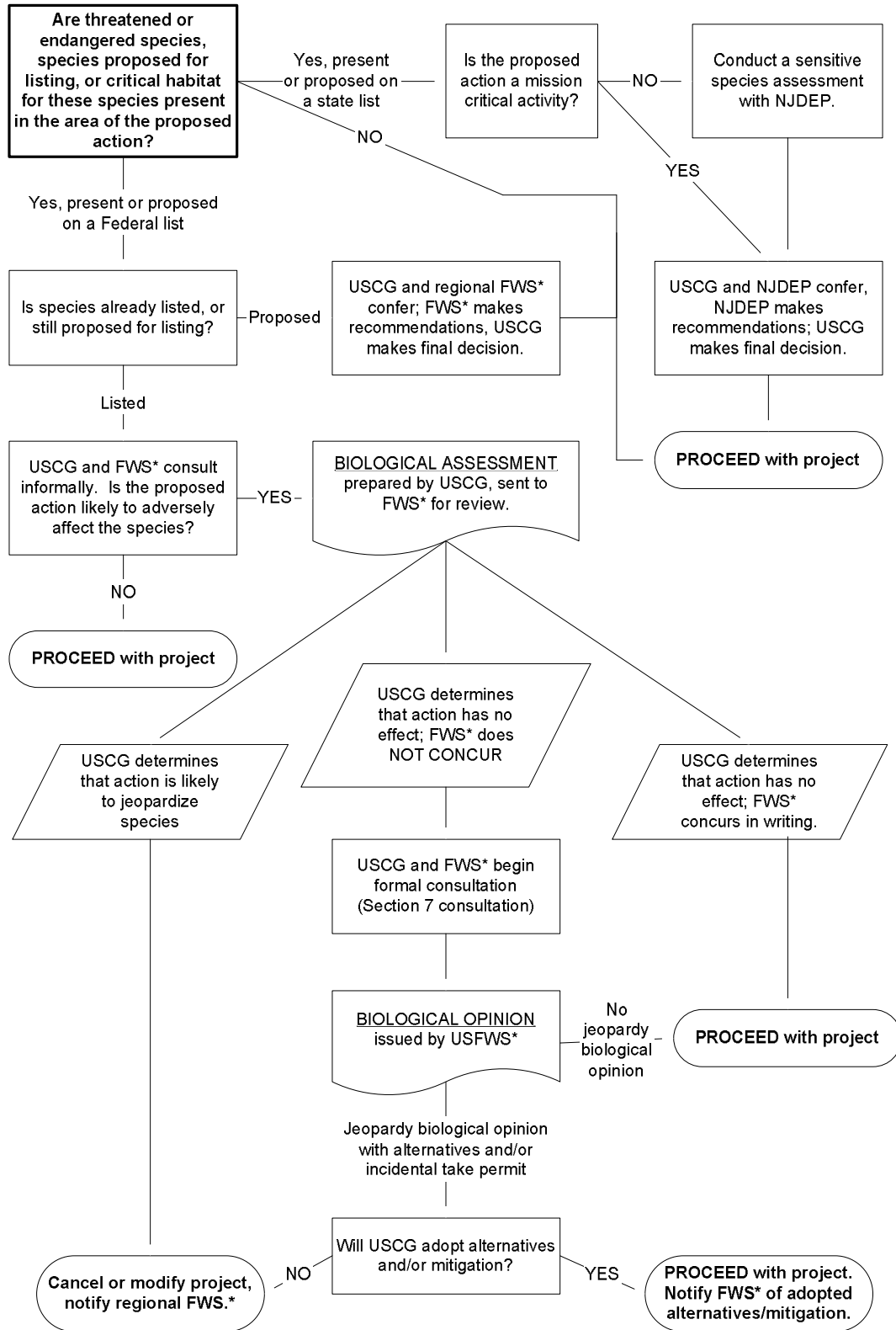
To attempt to meet the threatened and endangered species management goals identified in Table 4-8, the following management issues have been identified and objectives, actions, and monitoring criteria have been developed.

4.3.1 TE-1: Access to the Sensitive Species LMU

- **Concern:** As described in Section 3 of this INRMP, nesting populations of piping plover (federally threatened, state endangered), black skimmer (state endangered), and least tern (state endangered) are known to occur on the beaches of TRACEN Cape May. Strict guidelines are in place that controls the management of these species. Management of these populations will always be a high priority for USCG. Disturbance of these birds by human activity and pests is one of the primary threats to their existence. Increasing human activity during the nesting season has created significant disturbances to their breeding habits. Activities such as recruit training runs, pedestrians (tourists) walking, sunbathing, kite flying, vehicle traffic, jet skis, fireworks, and low flying aircraft jeopardize nesting success.

Concentrations of pedestrians may deter the birds from using a suitable habitat. Incubating piping plovers will flush when approached within 50-100 yards of the nest. This exposes the eggs to avian predators and adverse weather conditions (e.g., heat and cold). Repeated or extended exposure of shorebird eggs on hot days may cause overheating, killing the embryos; while excessive cooling may kill embryos or retard their development. Pedestrians can also displace unfledged chicks, forcing them out of preferred habitats, increasing their potential for predation, decreasing time spent feeding, and cause unnecessary expenditure of energy (TRACEN 2001).

- **Objective:** Maximize the productivity of breeding shorebirds aboard TRACEN Cape May.
- **Actions:** 1. The beach area is off limits per TRACENINST 1710.5D, *Regulations Concerning Training Center Cape May's Jetty and Beach*.
 - Access points at the Southwest Gate, Fraser Avenue, and the bunkers are roped off and signs are installed indicating beach closure.
 - Boy Scouts who camp behind the Pavilion are notified that there is no beach access from MWR prior to their arrival. This area is also roped off and signs are placed indicating closure.
 - Access for security vehicles and firing range personnel is allowed to keep people away from the surface danger zone at the firing range. Security vehicles will access the beach via the Air Station and only when there is potential of pedestrians getting into the surface danger zone. Security vehicles drive along the low water mark only. Firing



*G-SEC must be informed/copied on all interagency coordination.

range personnel will only access the beach behind the range to assure the area is clear. Access for security vehicles is changed dependent on the location of individual shorebird nests, colonies, or chicks. In this capacity, vehicles will follow procedures listed below:

- Motorized USCG vehicle use is restricted to emergency use only during the period when flightless piping plover chicks may be present on the beach (May 15 to August 31).
 - Essential vehicles should travel through chick habitat areas only during daylight hours, and should be guided by a qualified monitor who has first determined the location of all unfledged plover chicks.
 - Speed of vehicles should not exceed 5 miles per hour.
 - A log should be maintained by the USCG of the date, time, vehicle number and operator, and purpose of each trip through areas where unfledged chicks are present. Personnel monitoring plovers should maintain and regularly update a log of the numbers and locations of unfledged plover chicks on each beach. Drivers of essential vehicles should review the log each day to determine the most recent number and location of unfledged chicks.
2. Essential vehicles should avoid driving on the wrack line, and travel should be infrequent enough to avoid creating deep ruts that could impede chick movements. If essential vehicles are creating ruts that could impede chick movements, use of essential vehicles should be further reduced and, if necessary, vehicle use should be restricted to emergency use only.
 3. Symbolic fencing is erected every April and is taken down in December as an added deterrent and to further isolate the nesting areas. This is done to preclude any disturbance from the access of unauthorized personnel who unknowingly walk into the nesting area via Cape May Beach.
 - The symbolic fencing consists of string, posts, and signs as shown in Figure 4-4. Taping of the fencing is discouraged except in area where high visibility is necessary due to startling associated with tape blowing in the wind. While piping plovers and black skimmers become quickly accustomed to the noise associated with the wind blown tape, least terns often take a longer time to become familiar with the noises.
 - TRACEN Cape May personnel from the Environmental Protection and Safety Section erect the fence. Supplies are provided by the NJDFW. The fencing is erected in April and taken down in September.
 4. Tourists are controlled from accessing the beach from Cape May. Fencing is put up along the southwest gate indicating "U.S. Government Property – No Trespassing," but during low tide the signs are a significant distance away and at times can not be clearly seen. Signs can not be posted below the high tide mark, as they tend to wash away. Security patrols and NJDFW personnel continually escort individuals in violation from the beach. The placing of signs along the beach helps mitigate these trespasses.



Figure 4-4. Photograph of Symbolic Fencing

4.3.2 TE-2: Management Procedures for Piping Plovers

- **Concern:** The general management of this LMU is guided by TRACENMINST 16450 (*Endangered Species Management Plan*). Specific procedures including beach prohibitions, predator exclosures, habitat improvements, and monitoring of beach nesting birds are part of the provisions of piping plover management.
- **Objective:** Maximize the breeding productivity of piping plovers through the implementation of predator control measures and monitoring.
- **Actions:** 1. Exclosures are erected around piping plover nests to protect nests and incubating adults from predation. Time and placement of the nest is directed by the NJDFW. TRACEN Cape May personnel from the Environmental Protection and Safety Section assist in the construction of the exclosure.
 - Since the use of exclosures is not without risks, the predation threat must be assessed and the potential benefits and risks evaluated. Rates of nest depredation observed during the previous season, abundance of predator tracks on the beach, and other indicators of predator numbers and activity should be considered. Even on beaches that are generally suitable for exclosures, some individual nest sites may be physically inappropriate for exclosure, such as where the beach face is too steep.
 - Exclosures also draw attention to the exact location of nests, which may attract potential vandals as well as people who are simply

curious about these rare birds. Measures to minimize this threat include use of symbolic fences and signs to keep people away from the exclosures. The procedures for exclosure erection are described in Table 4-9.

- a. Continually monitor for the presence of predators in the Sensitive Species LMU. Predator species include red fox, gulls, feral cats, crows, grackles, skunks, and raccoons. NJDFW has identified the need for targeted fox removal on the beaches of TRACEN Cape May as part of the *Piping Plover Recovery Plan for New Jersey* (NJNHP 2002). NJDFW will implement fox removal specifically for protection of beach nesting birds. TRACEN Cape May personnel inform NJDFW POC's Mr. Dave Jenkins (908-735-9652) when fox or their signs are found on the beaches. Figure 4-5 is a photograph of a fox print observed on the Installation's beaches in the plover nesting area.
- Specific provisions of the beach replenishment actions have been implemented as an agreement with USACE. The *Beach Nesting Management Plan*, found in Appendix D-6 of this INMRP, includes specific guidance on the necessary procedures to implement prior to beach replenishment. Specific provisions for the beach replenishment actions have been implemented as an agreement with USACE. The Beach Nesting Management Plan, found in Appendix D-6 of this INMRP, includes specific guidance on the necessary procedures to implement prior to beach replenishment.
- **Monitoring Criteria:** Continual monitoring of piping plover breeding success, predator sightings, exclosure set up times and observations, breeding success rates, fledgling success rates, number of monitoring hours, number of eggs hatched, dates of breeding milestones, and any applicable field notes for each pair of plovers observed on the beaches are vital monitoring data.

4.3.3 TE-3: Potential Section 7 Consultation with FWS

- **Concern:** Under the ESA, any potential activity that could impact the success of the beach nesting birds must go through a consultation process with the FWS. This is to assure that the activity will not adversely affect the endangered species present in any way.
- **Objective:** Remain in compliance with all necessary Federal and state laws and guidelines.
- **Actions:** 1. For any action in proximity to the Sensitive Species LMU, TRACEN Cape May staff will follow the process depicted in Figure 4-3 for consultation under the ESA. FWS will determine if a consultation is required for this action. In addition, FWS will make the determination if a formal or informal Section 7 Consultation will be required for the particular proposed action. Figure 4-6 outlines the informal consultation process, while Figure 4-7 outlines the formal consultation process that will be followed if required.

Table 4-9. Procedures for Piping Plover Predator Exclosures

Activity	Details
Authorization	TRACEN Cape May does not possess authorization to erect predator exclosures without biologists from the NJDFW. Authorizations are necessary to meet legal requirements under Sections 9 and 10 of the ESA.
Exclosure Design	<p>Exclosures should be constructed of 2 by 4 inch welded wire fence and supported by at least four sturdy metal or wooden stakes. Fences should be buried at least 8 inches in the sand (12 inches is better) and should be a minimum of 36 inches above the sand. Tops of posts supporting the fence must be below the top wire to prevent use of the posts as perches by crows and other avian predators.</p> <p>Triangular, rectangular, and circular exclosure designs have all been used effectively. Minimum distance from the nest to the fence should be five feet: (ten foot diameter for a circular exclosure).</p> <p>Since avian predators such as crows, grackles, ravens, and gulls are present in the area, either a net or twine top must be installed, as exclosures may cue these avian predators to the nest location. Material used for net tops (generally fruit-tree or blueberry netting) should have a mesh size of 3/4 inches or less; mesh should lie flat and form square holes without stretching (do not use nets that are intended to be stretched). Nets should be cut to fit the top of the exclosure with minimum overhang, pulled taut, and securely attached to wire fence with hog clips or similar devices. Alternatively, seining twine may be strung in parallel rows about 6 to 8 inches apart across the top of the exclosure. Both monofilament and perpendicular string patterns have been associated with entanglement of adult plovers and are not permitted. Rigid tops, including fencing, should never be used on top of exclosures, as they attract perching birds.</p>
Construction	<p>Exclosure construction is most safely and efficiently accomplished with a crew of two to four persons. Construction should be practiced around a “dummy nest” until the operation can be done smoothly. Construction time should not exceed 20 minutes and can generally be accomplished in less than 10 minutes without sacrificing quality of construction (i.e., secure Installation of posts and careful attachment of wire fencing and tops). Unless the incubating bird stays on the nest, a basket or similar device should be inverted on the nest prior to exclosure construction to mark its location. Once construction is completed, rake or otherwise smooth out the sand immediately around the fence so that the surface of the sand is flush with the bottom wire, assuring easy access for birds walking through the fence. Exclosures should be constructed after a full clutch of eggs has been confirmed.</p> <p>Exclosures should be constructed early or late in the day, to avoid exposing the eggs to the hot sun. Construction during rainy, very windy, or otherwise inclement weather must also be avoided.</p>

Table 4-9. Procedures for Piping Plover Predator Exclosures (continued)

Activity	Details
Monitoring	<p>As soon as construction is completed, all persons should move well away from the nest, preferably to a location out of sight of the birds. The nest should be monitored until an adult returns to the nest, resumes incubation, and then exchanges with its mate. If neither adult returns to the nest within 60 minutes or the birds' behavior appears abnormal, the exclosure should be removed. Exclosed nests should be monitored at least every other day from a safe distance.</p> <p>Monitors should be alert for evidence that crows, gulls, or other birds are perching on exclosure fences or tops. Loss of several nests to the same predator species during a short time period or tracks that suggest a predator is systematically visiting exclosures should be immediately reported to the NJDFW wildlife agency and the FWS. Monitors should also assure that sand, wrack, or other debris around the base of the exclosure does not obstruct the ability of the plovers to walk under the bottom horizontal wire around a significant portion of the exclosure.</p> <p>TRACEN Cape May staff monitors the exclosures after construction. Whenever exclosure failure (nest depredation or abandonment) is detected, a thorough investigation of the site should be made. Tracks, fur, means of entry, or egg-shell remains may aid the identification of predators. Means of predator entry into the exclosure may suggest needed modifications in exclosure design. In cases of suspected nest abandonment, an extremely thorough search of the area should be made for any signs of adult mortality, including predator track patterns, signs of a struggle; or plover feathers, bones, or other remains. The area should also be monitored for several days for sightings of one or both adults.</p>
Reporting	<p>Any observations of potential problems are reported to NJDFW immediately. Situations that are especially important to report include any evidence of adult plover mortality or unusual numbers of nest depredations or abandonments.</p> <p>Send copies of reports regarding exclosure problems to:</p> <p>U.S. Fish and Wildlife Service Weir Hill Road Sudbury, MA 01776 Attention: Anne Hecht Telephone: 508-443-4325; Fax: 508-443-2898</p>

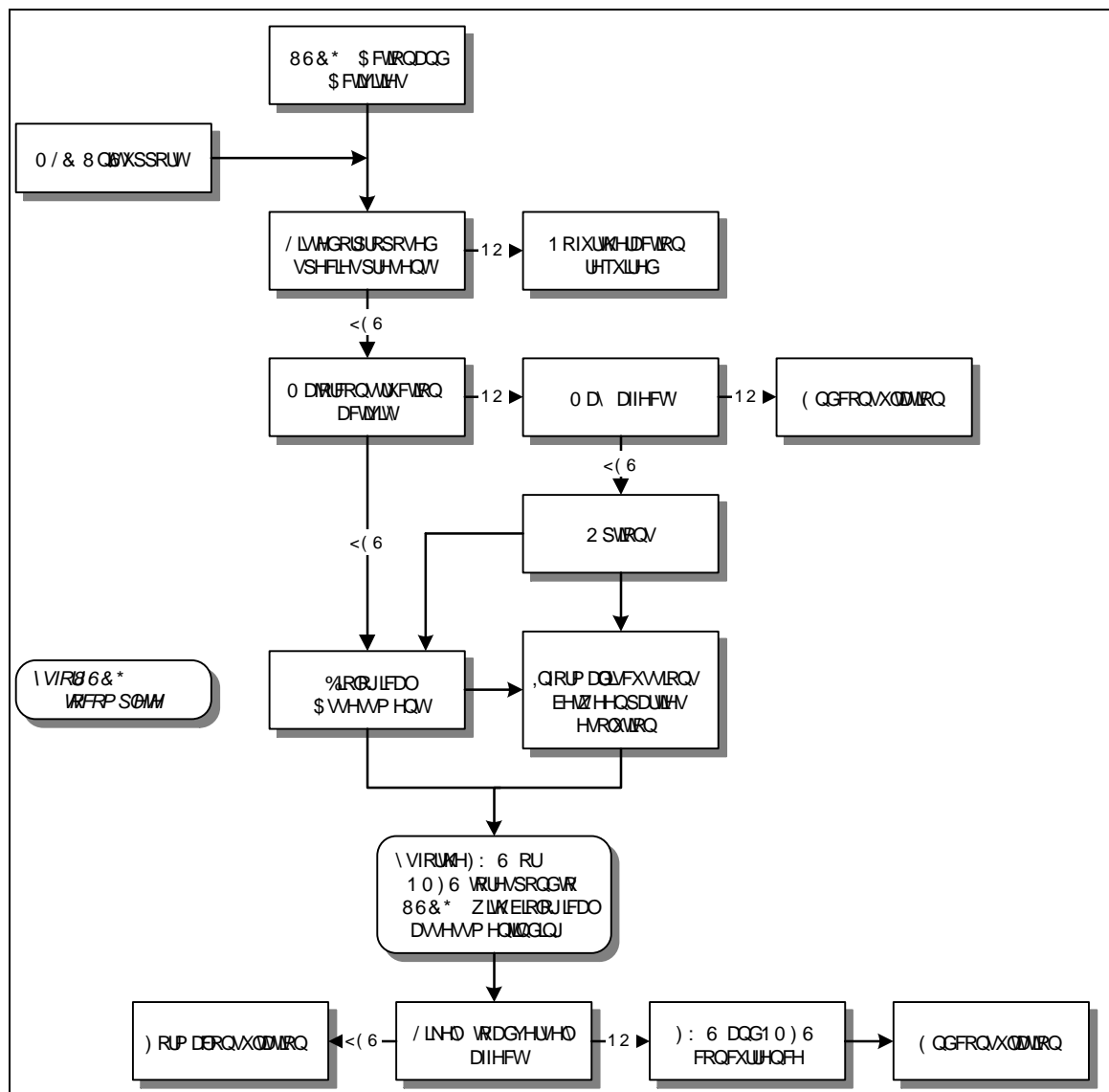


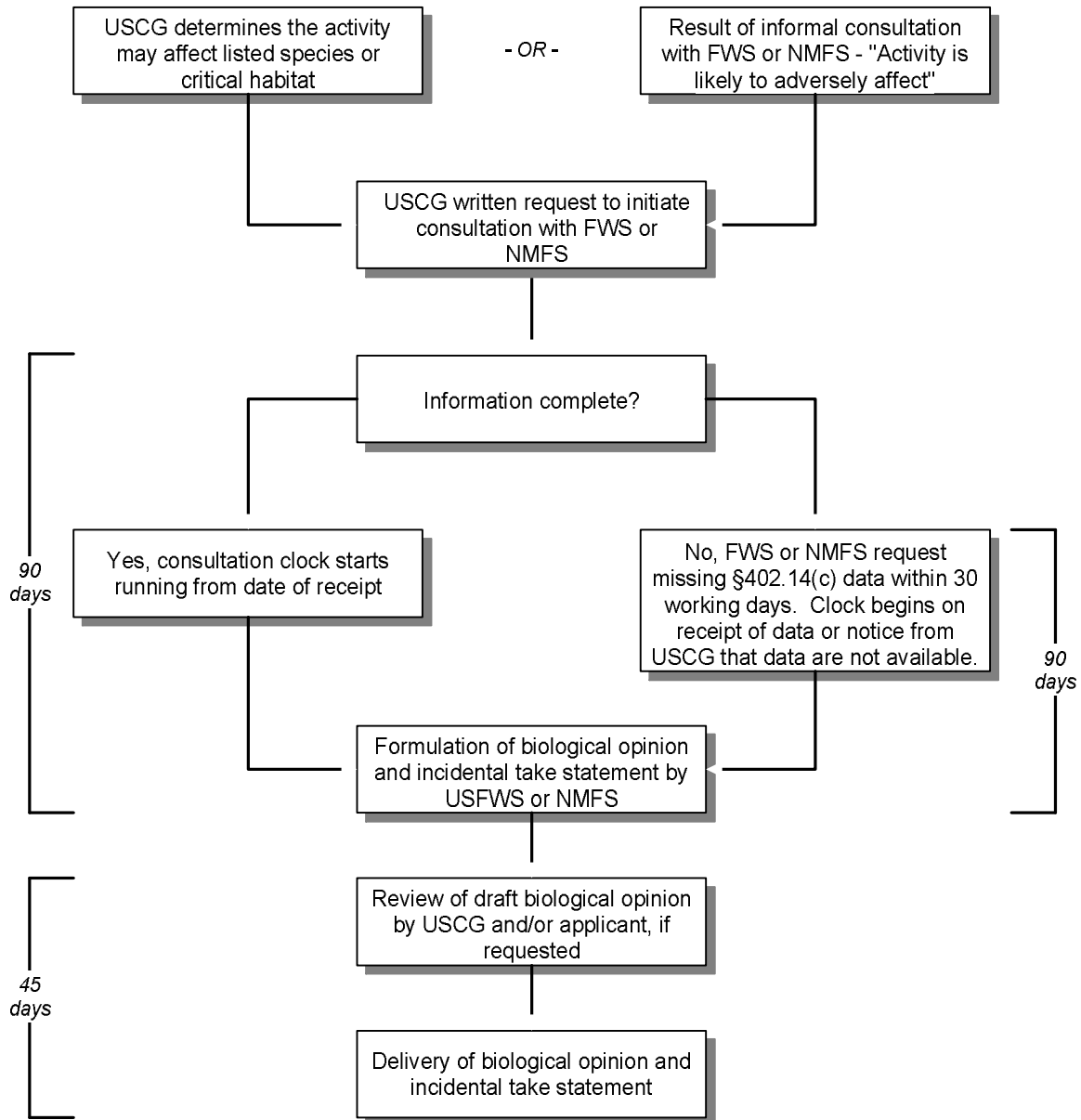
Figure 4-5. Photograph of Fox Prints at TRACEN Cape May

- **Monitoring:** TRACEN Cape May personnel from the Environmental Protection and Safety Section screen all proposed projects to determine if they have the potential to impact sensitive species on the Installation. All procedures for coordination with NJDFW and FWS are followed for all projects.

4.3.4 TE-4: Need for Habitat Improvements for Beach Nesting Birds within the Sensitive Species LMU

- **Concern:** There is need to conduct habitat improvements in the Sensitive Species LMU. Vegetation has expanded from the dunes and have made some of the habitat for beach nesting birds inappropriate to meet breeding requirements. While this vegetation is essential to promote the stability of the dunes and beach, alterations can be made which provide additional nesting habitat for beach nesting species. In general, plovers select nest sites that allow incubating adults good visibility, yet afford them some camouflage from predators (Page and Ribic 1985, Powell and Cuthbert 1992). The vegetation on the beach face has become very thick and does not provide adequate visibility for either piping plovers, least tern, or black skimmer. In addition, the dense vegetation provides cover for predators thereby reducing beach nesting bird productivity.
- **Objective:** Enhance nesting habitat for beach nesting birds by reducing vegetative cover.





- **Actions:** 1. To increase nesting habitat for beach nesting birds, vegetation should be removed in strips to open up the sand while maintaining structure of the beach and dune complex. This should be done through mechanical removal of vegetation. Removal of vegetation by hand has been tried in the past, but proved to leave the area with many large holes. A tractor with a grading rake will be used while minimizing major disruptions to the structure of the soil and facilitate erosion of the beach face. The grading rake should have a heavy grade compactor attached to the rear to pack down the sand following disturbance. Attaching the equipment in tandem will minimize the number of passes over the area that occurs. Vegetation should be removed in alternating swaths of twenty meters. Two treatment areas should be attempted in the first trial and its effectiveness evaluated based on the prescribed monitoring criteria. In most cases, the sand remains too soft unless the area is treated early in the fall just after the breeding season. If no major storm event (i.e., washover) occurs on the site during the winter, mechanical compaction of the sand will be required prior to the breeding season to ensure that the area is attractive to birds nesting the following season. Remaining vegetation must be scattered and sparse in order to suppress their action as corridors for predators.
- 2. Prior to any ground disturbance, surveys for the presence of seabeach amaranth (*Amaranthus pumilus*) must be conducted as described in Section 4.3.5.
- **Monitoring Criteria:** Annual assessments of the density of beach vegetation should be correlated with nesting attempts and fledgling success rates. Determination on future treatment of vegetation should be considered based on the findings of the nesting success rates.

4.3.5 TE-5: Survey for Seabeach Amaranth

- **Concern:** Seabeach amaranth has been eliminated from two-thirds of its historic range. This species formerly occurred on barrier island beaches from Massachusetts to South Carolina. It is only extant in significant numbers in New York and the Carolinas, and in tiny stands in Delaware and Maryland. As of 1995, 55 populations remain, all in a narrow band of suitable habitat (even formerly, the actual area occupied was quite small). Many threats to this species exist, including construction of sea walls and dune fencing, development, heavy recreational use, and off-road vehicle traffic. The federally listed (threatened) plant was documented in nearby Monmouth County, New Jersey in 2001. Further surveys determined that isolated patches of this species occur as far south as Upper Township, Cape May County, New Jersey. This plant has the potential to occur at the Installation in future years. The USCG obligations of Section 7(a)(1) of the ESA apply to seabeach amaranth. FWS anticipates a southern expansion of this species into new areas which could potentially include TRACEN Cape May (FWS 2002).
- **Objective:** Document the presence or absence of seabeach amaranth at TRACEN Cape May and implement management protocols if necessary.
- **Actions:** 1. Conduct an annual survey of the TRACEN Cape May's beaches between August 15 and September 15 for the presence or absence of seabeach amaranth, and report the findings to FWS.

2. If seabeach amaranth is found, avoid pedestrian or vehicle use within areas supporting the species.
 3. Ensure that beach vegetation control to enhance piping plover habitat does not adversely impact seabeach amaranth.
- **Monitoring Criteria:** Annually assess seabeach amaranth population levels should the species be confirmed on the Installation beaches.

4.4 WETLANDS AND FLOODPLAINS

The U.S. Army Corps of Engineers (USACE) defines wetlands as “those areas that are inundated or saturated with ground or surface water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas” (33 *CFR* 328). Wetlands are an important natural system because of the diverse biological and hydrologic functions they perform. These functions may include water quality improvement, groundwater recharge, pollution treatment, nutrient cycling, provision of wildlife habitat and niches for unique flora and fauna, stormwater storage, and erosion protection.

Wetlands are protected as a subset of the “waters of the United States” under Section 404 of the Clean Water Act (CWA) and are depicted in Figure 4-8. The term “waters of the United States” has broad meaning under the CWA and incorporates deep-water aquatic habitats and special aquatic habitats (including wetlands). “Jurisdictional” waters of the United States are areas regulated under the CWA and may also include coastal and inland waters, lakes, rivers, ponds, streams, intermittent streams, vernal pools, and “other” waters that if degraded or destroyed could affect interstate commerce.

Section 404 of the CWA authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredged or fill materials into the waters of the United States, including wetlands. In addition, Section 404 of the CWA also grants states with sufficient resources the right to assume these responsibilities. In view of the limited resources of USACE, EPA, and FWS, New Jersey adopted legislation, the New Jersey Freshwater Wetlands Protection Act (N.J.S.A. 13:9B – rules at N.J.A.C. 7:7A) to regulate and monitor the state’s freshwater wetland resources, and assume administration of the Federal permit program. The regulatory jurisdiction of these agencies also includes tidal waters as depicted in Figure 4-9.

New Jersey’s freshwater wetlands are divided into three classifications based on resource value: exceptional, optimal, or intermediate resource value (N.J.A.C. 7:7A-2.5). *Exceptional wetlands* are the highest quality wetlands based on their ecosystem functions and the value they provide to the ecosystem and society. *Optimal wetlands* are fully functional wetlands that have less of a value to society. *Intermediate wetlands* are those that have a lesser functional role in the ecosystem and provide less of a value to society. The classification of a particular wetland is a factor in, among other things, considering alternatives to the proposed regulated activity, in determining the size of the transition area, and in assessing mitigation. Freshwater wetlands of *exceptional resource value* shall be freshwater wetlands, which exhibit any of the following characteristics:

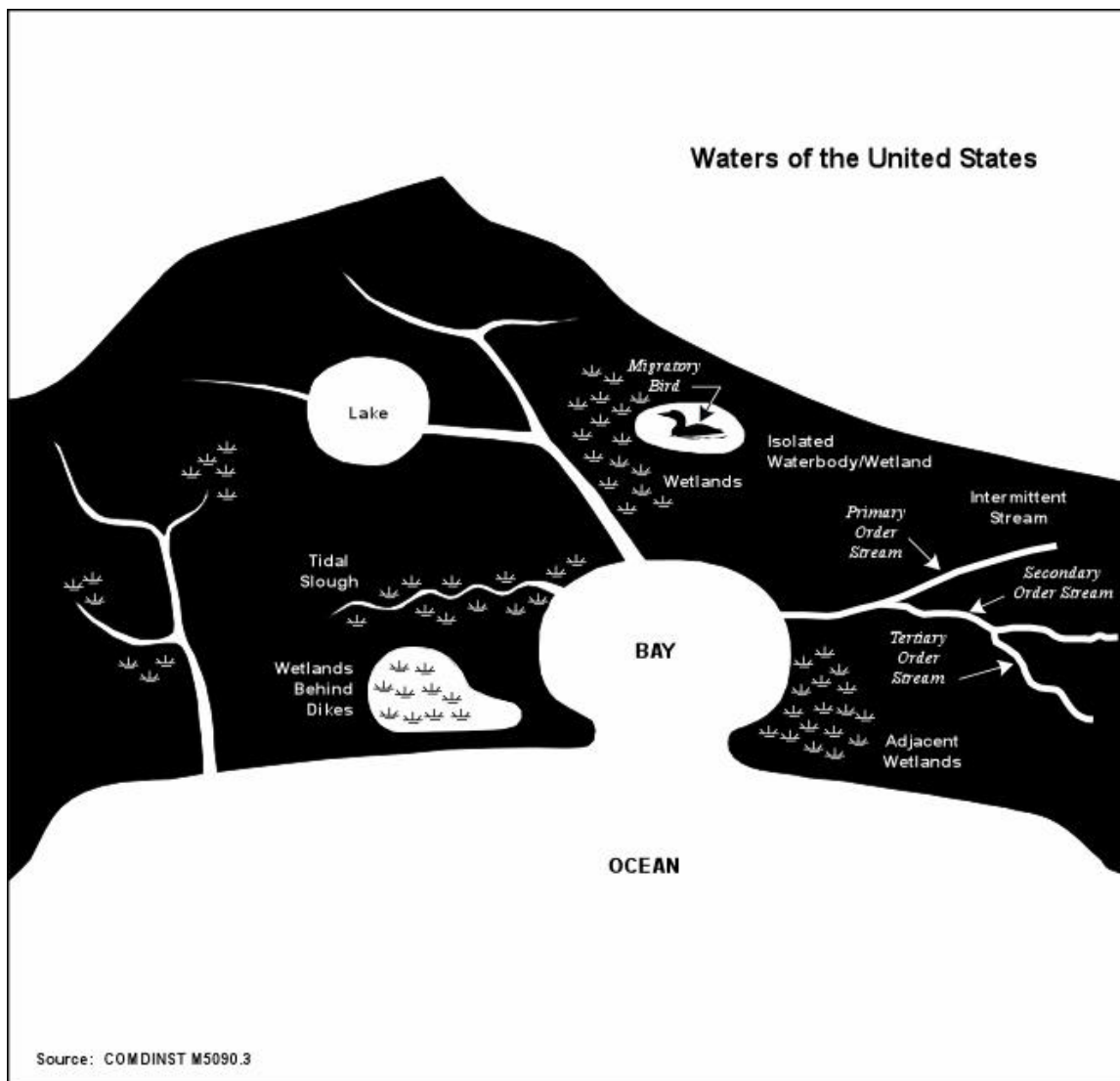


Figure 4-8. Waters of the United States

1. Those which discharge into FW1 waters [those freshwaters that originate in and are wholly within Federal or State parks, forests, fish and wildlife lands, and other special holdings, that are to be maintained in their natural state of quality (set aside for posterity, and not subjected to any wastewater discharges of human origin), as designated in the NJDEP's Surface Water Quality Standards] or FW2 trout production waters or their tributaries; or
2. Those which are present habitats for threatened or endangered species, or those which are documented habitats for threatened or endangered species, and which remain suitable for breeding, resting, or feeding by these species during the normal period these species would use the habitat.

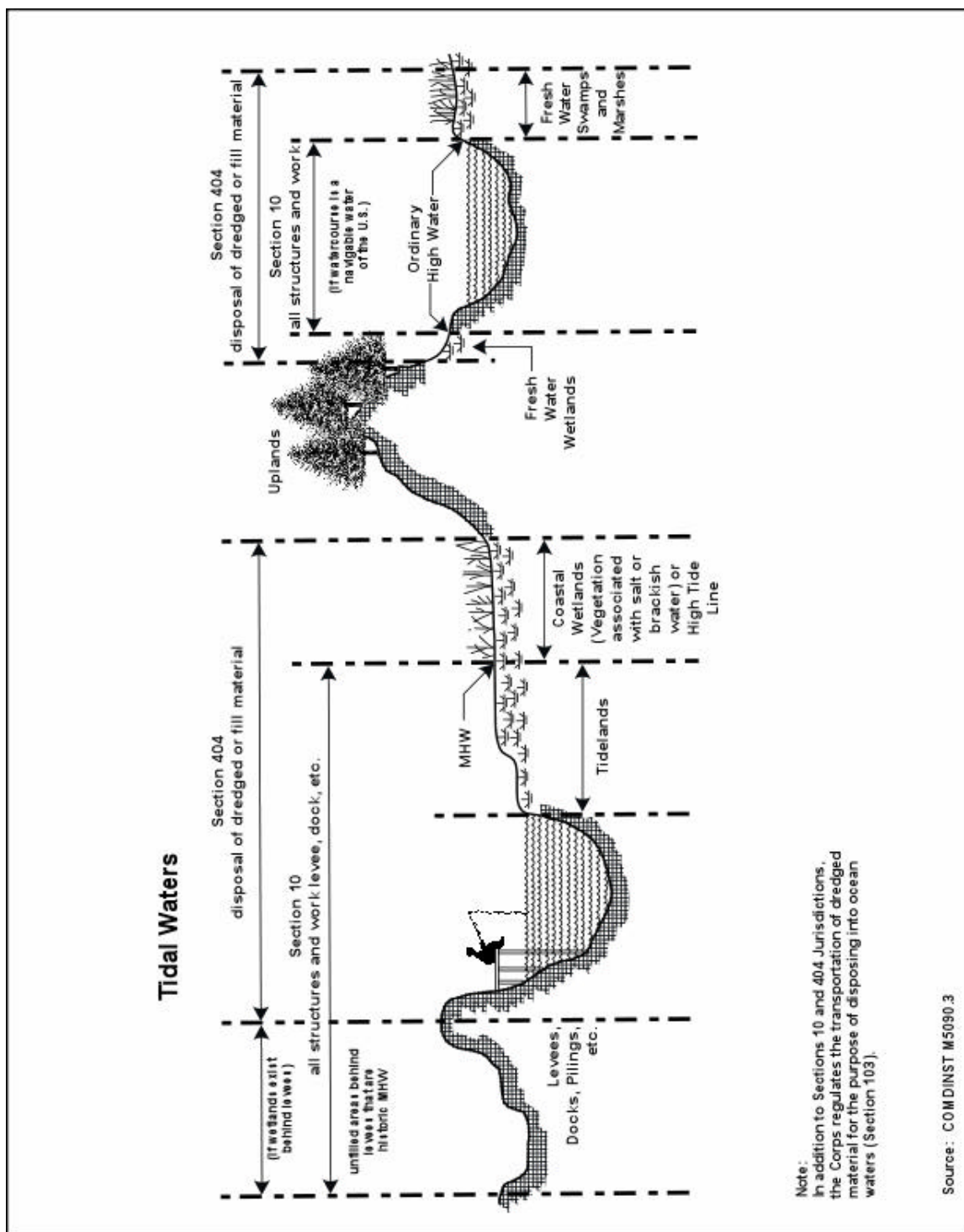


Figure 4-9. Scope Areas Regulated Under the Clean Water Act

Freshwater wetlands of *optimal resource value* shall be freshwater wetlands which do not exhibit the characteristics of exceptional value wetlands, and which are:

1. Isolated wetlands which are more than 50 percent surrounded by development and less than 5,000 square feet in size. "Development" means lawns; maintained landscaping; impervious surfaces; active railroad rights-of-way; and graveled or stoned parking/storage areas and roads as long as these uses that were legally existing prior to July 1, 1988 or were permitted under the New Jersey Freshwater Wetlands Act. Development must occupy more than 50 percent of the area within 50 feet of the wetland boundary in order for the wetland to meet the criterion of more than 50 percent surrounded by development;
2. Drainage ditches;
3. Swales; or
4. Detention facilities.

Freshwater wetlands of *intermediate resource value* shall be all freshwater wetlands not defined as exceptional or optimal.

The New Jersey Freshwater Wetlands Protection Act protects freshwater wetlands and transition areas or "buffers" around freshwater wetlands. A transition area is a strip of land bordering wetlands. Typically, the width of the transition area may vary from 150 feet to no transition area, dependent upon the value of the particular wetland. A transition area is required adjacent to freshwater wetlands of exceptional resource value (standard width of 150 feet) and of intermediate resource value (standard width of 50 feet). These standard widths can only be modified through the issuance of a transition area waiver by NJDEP. A transition area is not required adjacent to freshwater wetlands of ordinary resource value or adjacent to State open waters.

Section 401 of the CWA gives the state board and regional boards the authority to regulate through water quality certification any proposed federally permitted activity that may result in a discharge to water bodies, including wetlands. The state may issue certification (pursuant to N.J.S.A. 58:10A-1 et seq.), with or without conditions, or deny certification for activities that may result in a discharge to water bodies.

Therefore, even an inadvertent encroachment into New Jersey freshwater wetlands or state open waters (as defined at N.J.A.C. 7:7A-1.4) that results in displacement or movement of soil or fill materials has the potential to be viewed as a violation of the New Jersey Freshwater Wetlands Protection Act.

Furthermore, wetlands are protected under Executive Order (EO) 11990 - *Protection of Wetlands* (43 FR 6030), the purpose of which is to reduce adverse impacts associated with the destruction or modification of wetlands. Responsible official at TRACEN Cape May must sign a finding of no practicable alternative (FONPA) before any action within a Federal wetland may proceed, as specified in COMDTINST 16475.2B. In preparing a FONPA, the TRACEN must consider the full range of practicable alternatives that will meet justified program requirements to ensure they are within legal authority of the USCG, meet technology standards, are cost-effective, do not result in unreasonable adverse environmental impacts, and other pertinent factors. When the practicality of alternatives has been fully assessed, only then should a statement regarding the FONPA be made into the associated finding of no significant impact (FONSI) and/or record of decision (ROD).

As a result of the previously cited Federal and state regulations, the USCG is responsible for identifying and locating Jurisdictional waters of the United States (including wetlands) occurring on USCG Installations where these resources have the potential to be impacted by mission activities. Such impacts could include construction of roads, buildings, navigation aids, and other appurtenant structures or activities as simple as culvert crossings of small intermittent streams, rip-rap placement in stream channels to curb accelerated erosion, and incidental fill and grading of wet depressions.

Floodplains are defined as areas adjoining inland or coastal waters that are prone to flooding. These areas must be reserved to discharge the 100-year flood without cumulatively increasing the water surface elevation more than a designated height. When a floodplain is established, no additional obstruction (e.g., a building) should be placed in the floodplain that will increase the 100-year floodwater surface elevation. Furthermore, New Jersey regulates construction in a floodplain under the Flood Hazard Area Control Act (N.J.S.A. 58:16A-50 et seq. and its implementing rules at N.J.A.C. 7:13). Floodplains at the Installation are shown in Figure 4-10.

EO 11988, *Floodplains Management* requires all Federal agencies to provide leadership and take action to reduce the risk of flood loss; minimize the impacts of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values of floodplains when acquiring, managing, or disposing of Federal lands. USCG TRACEN responsible official or another designated official must sign an FONPA before any action within a floodplain may proceed. When the practicality of alternatives has been fully assessed, only then should a statement regarding the FONPA be made into the associated FONSI and/or ROD.

In addition, if action is taken that permits an encroachment within the floodplain that alters the flood hazards on a National Flood Insurance Rate Map (FIRM) (i.e., changes to the floodplain boundary), TRACEN Cape May must submit an analysis reflecting those changes to the Federal Emergency Management Agency (FEMA). FEMA headquarters can be contacted at (202) 646-3461 to obtain booklet MT-2, *Revisions to National Flood Insurance Program Maps*, for further guidance.

The major goal in wetland and floodplain management is to minimize the impact that the TRACEN Cape May missions have on wetlands and floodplains. TRACEN Cape May natural resources staff strives to create healthy, functional wetlands that can sustain minor operational influences outside indirect infringement of wetlands. When possible, it is the goal to enhance wetland functions to create wetlands that maximize the values that wetlands have within the ecosystem and to society (e.g., floodwater retention, water quality protection, etc.). It is also the goal to maximize floral diversity of wetland communities, which, in turn, maximizes the faunal diversity of the ecosystem. Through achieving these goals, TRACEN Cape May can manage for no net loss of wetland and floodplain acreage, functions, and values. The goals for wetland and floodplain management are summarized in Table 4-10.

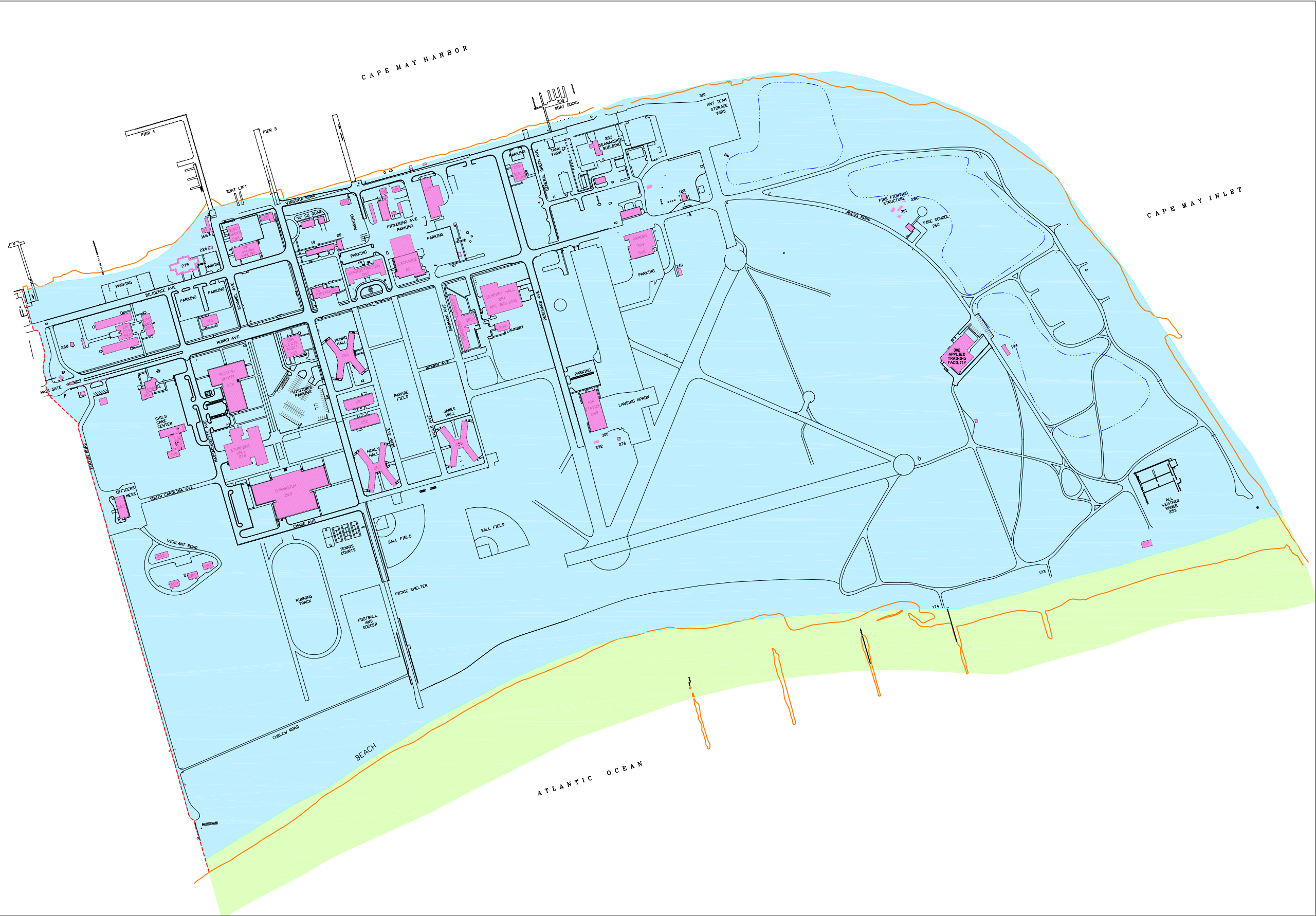
To meet the goals of wetland and floodplain management, the following topics of concern that compromise achieving particular goals are described. This section also presents objectives and management actions designed to meet these wetland and floodplain management goals.

Table 4-10. Summary of Wetlands and Floodplains Management Goals

Wetlands and Floodplains Management Goals
<ul style="list-style-type: none"> • Remain in compliance with USACE and NJDEP wetlands regulations. • Minimize the operational impact of TRACEN Cape May missions on wetlands and floodplains. • Maintain healthy, functional wetlands that can sustain minor operational influences and minor, inadvertent encroachments. • Enhance wetland functionality to maximize societal-based wetland values within local ecosystems. • Maximize floral and faunal diversity of wetland communities in areas that will not affect the mission. • Manage for no net loss of wetland and floodplain acreage, functions, and values.

4.4.1 WT-1: Location and Extent of Freshwater Wetlands

- **Concern:** Although 27 acres of wetlands have been mapped at TRACEN Cape May (Figure 4-11), confirmation of the location and extent of the freshwater wetlands is necessary to ensure that inadvertent violations do not occur in the future. Confirmation is also necessary to ensure that appropriate permits are obtained before encroachments into areas occur. During the September 2001 data collection site visit to TRACEN Cape May by e²M, it was noted that some of the areas mapped by NJDEP do not display the hydrology and soil characteristics employed by the *1989 Corps of Engineers Wetlands Delineation Manual* (herein referred to as the “1989 Manual”). Previous wetland delineations were performed in 1993 and 1994 and are no longer legally binding.
- **Objective:** The objective is to gain a clear understanding of the locations of wetland boundaries prior to encroachment into wetland. To remain in compliance with the provisions of the CWA, and New Jersey Freshwater Wetlands Protection Act, a step-by-step, comprehensive ground-level wetlands delineation within these areas should be conducted and confirmed by NJDEP (i.e., through issuance of Letter[s] of Interpretation) should encroachments be planned in these areas.
- **Actions:**
 1. Identify and delineate freshwater wetlands prior to potential wetland encroachments. This shall include wetland delineations for all projects/activities that have the potential to occur in or adjacent to wetland boundaries.
 - a. Under the New Jersey Freshwater Wetlands Protection Act designation of freshwater wetlands is based upon the three-parameter approach (i.e., hydrology, soils, and vegetation) enumerated in 1989 Manual (N.J.A.C. 7:7A-2.4(a)).

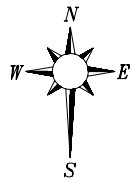


LEGEND

- Base Boundary
- Buildings
- High-Tide Line
- Dredge Spoil Areas
- TRACEN Detail

Floodplains:

- Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
- Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.



400 300 200 100 0 100
SCALE IN FEET

Figure 4-10. Locations of the
Floodplains at TRACEN
Cape May

- b. The 1989 Manual outlines the protocols and procedures for wetlands identification and delineation. The protocols presented in the 1989 Manual require the presence of three basic parameters to field identify and delineate wetlands: the predominance (more than 50 percent) of hydrophytic vegetation (plant species that commonly occur in wetlands); the presence of hydric soils (soils developed under reducing conditions); and the evidence of wetlands hydrology (the inundation or saturation by surface or groundwater periodically to support hydrophytic vegetation and develop hydric soils). In undisturbed field conditions, all three of these diagnostic criteria must be present to fulfill wetlands classification criteria. The 1989 Manual further describes protocols to be used in the delineation of wetlands in disturbed areas (USACE 1989).
 2. If wetland encroachments are found to be necessary, appropriate permits and certifications should be obtained from the NJDEP before the initiation of any work within the jurisdictional area(s). Figure 4-12 presents a flow diagram detailing the wetlands permitting process.
 3. Continue to develop the wetlands inventory database by compiling information on wetlands characteristics, as they are collected, into a format compatible with the Installation's mapping software or the future geographic information system (GIS) software (see Topic No. GIS-1). This data should include acreage, dominant species, soil types, and wetland classification according to the Cowardin (1979) classification system.
- **Monitoring Criteria:** Semi-annually inspect confirmed and suspected wetland locations for evidence of land-disturbing activities.

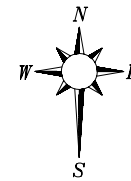
4.4.2 WT-2: Wetlands Assessment and Management

- **Concern:** TRACEN Cape May does not have a current management plan for the conservation or enhancement of the Installation's wetlands resources. In addition, the wetlands vary in their associated functions and values, which could lessen the mitigation burden in lieu of potential encroachments.
- **Objective:** Develop a greater understanding of the functions and values of the wetland complexes present at TRACEN Cape May. Information obtained should include a complete understanding of the functions of wetlands through the interaction of the hydrologic systems, soils, vegetation, and fauna of the areas. Completion of the following actions will provide TRACEN Cape May with the tools necessary to more effectively evaluate potential future impacts and to gauge appropriate mitigation measures. In addition, the following actions will allow for the adaptive management of the Installation's wetland resources.
- **Actions:** 1. As part of the comprehensive wetland delineations discussed in Topic WT-1, the functions and values of the TRACEN Cape May's wetlands should be determined to provide TRACEN Cape May with the tools necessary to more effectively evaluate potential future impacts.



LEGEND

- Base Boundary
- Buildings
- High-Tide Line
- Dredge Spoil Areas
- TRACEN Detail
- Wetlands



400 300 200 100 0 100
SCALE IN FEET

Figure 4-11. Locations of
Wetlands at TRACEN
Cape May

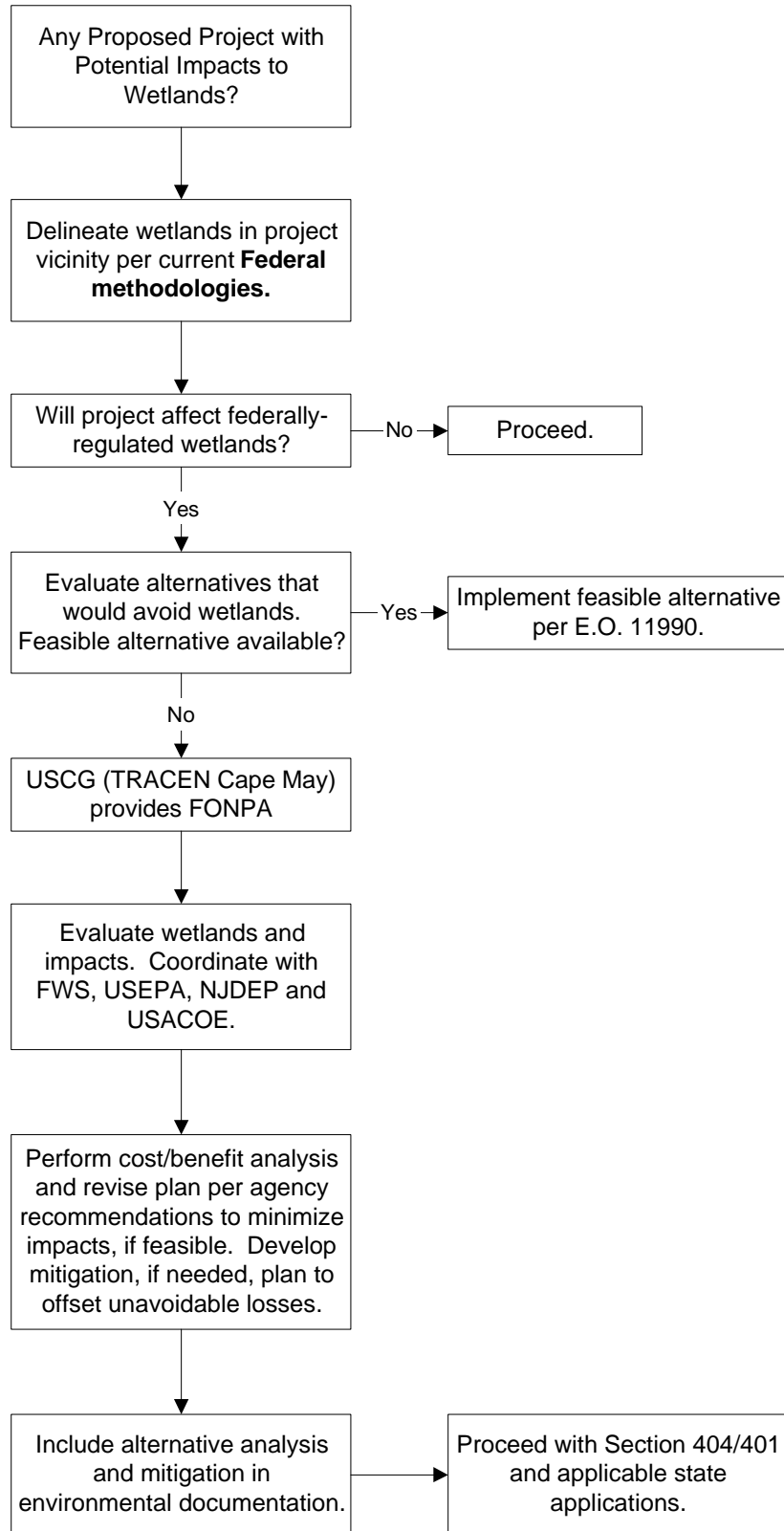


Figure 4-12. Wetlands Permitting Process.

2. Adaptive management strategies for the conservation and enhancement of the TRACEN Cape May's wetlands resources will include the following provisions:
 - a. Maintain 150-foot buffers around wetlands of exceptional value. Where it is determined that a wetland has, or could have, significant habitat value, or where current activities adjacent to a wetlands area are causing noticeable adverse impacts on the habitat, buffers of more than 150 feet are considered. Activities within buffer zones are limited to those that would cause little or no impact on or disturbance to the wetlands. In cases where established activities already occur within buffers and cannot be reasonably changed, those wetlands are subject to increased monitoring.
 - b. Continue to develop the wetlands inventory database by compiling information on wetlands characteristics, as they are collected, into a format compatible with the TRACEN Cape May's current software. This data may eventually be included in a GIS for TRACEN Cape May (see Section 4.12).
 - c. Plan development and training to avoid wetlands impacts to the maximum extent possible and mitigate unavoidable impacts on wetlands functions.
 - d. Review operations and maintenance programs that potentially affect wetlands, and develop procedures and guidelines to avoid the loss of wetlands functions.
 - e. Evaluate general vegetative characteristics of wetlands to determine where potential future control of invasive species could result in measurable habitat value enhancement.
 - f. Pursue water quality management procedures that protect wetlands from excessive non-point source runoff.
- **Monitoring Criteria:** Semi-annually inspect confirmed and suspected wetland locations for evidence of land-disturbing activities. Should wetlands be found to be disturbed, re-assess wetland functions to determine if they have been altered.

4.4.3 WT-3: Installation Personnel's Understanding of Wetlands Locations and Regulations

- **Concern:** Installation and visiting personnel are unaware of the location of and the regulations that govern Jurisdictional wetlands and waters on TRACEN Cape May.
- **Objective:** Educate key Installation and visiting personnel on the processes for conducting the mission in proximity to the wetlands on TRACEN Cape May. The Environmental and Safety Office will continue to maintain an effective working relationship with the NJDEP.

- **Actions:**
 1. Develop and disseminate informational materials and a short seminar on the locations of Jurisdictional wetlands and the federal and state regulations designed to protect wetlands.
 2. Key Installation and visiting personnel who are likely to impact Jurisdictional wetlands or waters will be informed of the locations of wetlands and the types of activities that will be precluded within these areas.
 3. Develop and use a wetlands questionnaire designed to gauge the effectiveness of the informational materials and the short seminar.
 4. The Environmental and Safety Chief will have primary responsibility to act as a reviewer for all proposed jurisdictional wetlands and waters activities.
 5. Proper permitting procedures should be followed for all potential or planned encroachments.
- **Monitoring Criteria:** Assess the effectiveness of informational materials and the short seminar through the review of wetland questionnaires.

4.5 COASTAL ZONE MANAGEMENT

The Coastal Zone Management Act of 1972 provides for the protection of the nation's coastal areas by authorizing states to develop and implement management programs that preserve, protect, and enhance the resources of the waters of the coast and the adjacent lands. The State of New Jersey protects coastal waters and the land adjacent to them under a variety of laws, including the Waterfront Development Law (N.J.S.A. 12:5-3), the Coastal Area Facility Review Act (CAFRA) (N.J.S.A. 13:19), and the Wetlands Act of 1970 (N.J.S.A. 13:9A). Congress gave the states power to ensure that Federal activities within or outside the coastal zone that effect land or water use, or natural resources of the coastal zone are conducted in a manner that is consistent, to the maximum extent practicable, with the enforceable policies of a Federally-approved state coastal zone management plan. This includes direct agency actions, development projects within the coastal zone, and the granting of any Federal license or permits to conduct an activity affecting land or water use in the coastal zone. NJDEP applies the New Jersey Coastal Permit Program Rules (N.J.A.C. 7:7) and the Coastal Zone Management Rules, (N.J.A.C. 7:7E), to determine what may or may not be built in coastal zones. The coastal zone management area is shown in Figure 4-13.

In the event that USCG actions or activities may impact the coastal zone, the *Coastal Zone Management Coordination Procedures* (COMDTINST 16004.1A) shall be consulted, which assure compliance with the Coastal Zone Management Act (CZMA) (16 U.S.C. §§1451 to 1464). The CZMA encourages states to manage and conserve coastal areas as unique and irreplaceable resources (COMDTINST M5090.3). TRACEN Cape May also coordinates with the New Jersey Coastal Management Program for any activities that occur within the coastal management zone (CMZ).

As described in Section 3, New Jersey's coastal zone is vulnerable to a number of coastal hazards including chronic and episodic erosion, flooding, storm surge, tropical and extratropical storms, wind, and sea level rise, as seen in Figure 4-14. Many areas of the coast were developed long

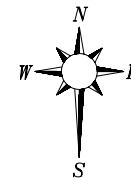


LEGEND

- Base Boundary
- Buildings
- Dredge Spoil Areas
- TRACEN Detail

Coastal Zone Management Areas:

- Beach
- Jetty
- Shoreline
- Stones
- Structures



400 300 200 100 0 100
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Figure 4-13. New Jersey
Coastal Zone Management
Area



Figure 4-14. Historic Evidence of Significant Coastal Erosion from Past Storm Events

before there was an understanding of coastal hazards. As a result, large areas of dense development exist in areas subject to coastal hazards. Coastal Zone Management (CZM) at TRACEN Cape May is important for the management of stochastic (involving chance or probability) events, which can threaten USCG property or significantly alter sensitive species habitat.

Several processes must be followed in should TRACEN Cape May proceed with any development. TRACEN Cape May is within the CAFRA Management zone and thus must complete a series of permit applications as part of the responsibilities of the properties within this zone. Table 4-11 describes the various activities which must be completed as part of the CAFRA application process.

The complete permit application package can be reviewed at either the municipal clerk's office or by appointment at the NJDEP's Trenton office. Application packages must be submitted to the LURP branch of NJDEP at:

New Jersey Department of Environmental Protection
Land Use Regulation Program
P.O. Box 439
Trenton, New Jersey 08625-0439
Attn: City of Cape May Section Chief

The remainder of this section is devoted to identifying the management goals, concerns that may compromise meeting these goals, as well as actions and objectives designed to achieve CZM goals. Table 4-12 presents a summary of the CZM goals.

Table 4-11. TRACEN Cape May Responsibilities within the CAFRA Permitting Process

1. Completed Land Use Regulation Program (LURP) application form.
2. Permit review fee in the form of a check, money order or government voucher (see attached fee schedule) Payable to: Treasurer, State of New Jersey, Environmental Services fund.
3. Photographs showing the specific location of the proposed development taken from a minimum of four different locations and labeled as to orientation. Submit originals mounted with description and location of each view.
4. White certified mailing receipts or other written receipt as evidence that three complete copies of the application package have been submitted to the clerk of the municipality in which the development is proposed, including a letter requesting that the clerk distribute one copy to the planning board and one to the environmental commission. The third copy shall be maintained in the clerk's office.
5. White certified mailing receipts or other written receipts as evidence that a copy of (1) the completed LURP application form, (2) the site plan (this plan may be on an 8.5 by 11 inch sheet of paper provided it generally depicts the proposed development and the site location), and (3) the notice below have been forwarded to the following parties: a) County Planning Board b) County Environmental Commission c) U.S. Army Corps of Engineers d) Municipal Construction Official e) Owners of real property, including easements, in accordance with 1 or 2 below: 1. For linear developments of one-half mile or more in length or shore protection developments including beach nourishment, beach and dune maintenance, or dune creation of more than one-half mile in length, public notice shall be provided in the official newspaper of the property location. The newspaper notice shall be published as a display ad at least four inches in width. 2. For developments other than linear development or shore protection developments of one half mile or more in length, public notice of the application shall be provided to all owners of real property, including easements, within 200 feet of the property to be developed.
6. Certified list of all owners of property within 200 feet of the property to be developed.
7. A copy of the public notice that was mailed to those parties listed at item 5 and 5(e)1 above.
8. Applications for sites within the Pinelands Preservation Area or Protection Area must submit either a Certificate for Filing, Notice of Filing, or a Certificate of Compliance from the Pinelands Commission along with the application. Applicants may contact the Pinelands Commission at (609) 894-7300 for further information.
9. Ten copies of documentation addressing the applicable Coastal Zone Management rules, N.J.A.C. 7:7E. This statement must discuss each individual policy that is applicable to the proposed project and may take the form of an Environmental Impact Statement (EIS) or Compliance Statement.
10. Evidence of Tidelands Ownership – Permit applications cannot be accepted for filing without evidence that a tidelands instrument has been previously issued or applied for. The Bureau of Tidelands Management may be reached at (609) 292-2573.

**Table 4-11. TRACEN Cape May Responsibilities within the CAFRA Permitting Process
(continued)**

11. Development Plans – Submit 15 copies of a development plan to the appropriate scale (MUST BE FOLDED if larger than 8 ½ x 11 inch size), indicating the following:
- a) The lot;
 - b) All existing waterfront structures (piers, bulkheads, pilings, etc.) on the lot and immediately adjacent lots (if vacant or if no structure exists, please state so);
 - c) Locations and dimensions of areas, structures, lots, wetlands, mean high water line, spring high water line, upland property, road and utility lines;
 - d) The proposed construction (structures, grading, filling, etc.) and the proposed development area clearly labeled and showing all distances and dimensions;
 - e) The general site location of the development, which may be on a county or local road map or an insert from U.S. Geological Survey topographic quadrangle map;
 - f) The scale of the survey or map, and a north arrow;
 - g) The name of person who prepared the plan and date prepared;
 - h) The name of the applicant, lot and block number(s), and municipality. Leave a margin of one inch on the top and left hand sides of the plan;
 - j) Location of upper and lower wetlands boundary. The “upper” wetlands boundary refers to the upland or landward limit of wetlands, and the “lower” wetlands boundary refers to the waterward limit of wetlands;
 - i) Dock plans must show channel location, depths at mean low water outshore of the dock for a distance of at least 100 feet (excluding lagoons), location and orientation of proposed mooring areas, mooring area depths at mean low water, including the method, time, date of soundings, cross sections of the dock including height and width of wetland crossings;
 - k) Dredging plans must show the area to be dredged, existing depth, proposed depth, adjacent depths, the amount of material to be dredged, the method of dredging, the exact location of the dredge material dewatering and disposal site by municipal block and lot, and the means of containing the spoils. A dredge material analysis may also be required; and
 - l) Plans for development landward of the mean high water line must show all existing structures, roads, utilities, topography, vegetation, coastal and freshwater wetlands, mean high water line, spring high water line, and any proposed structures, filling, grading, excavation, clearing, roads, utilities, sewers, landscaping and lighting, and soil erosion and sediment control devices.

Table 4-12. Summary of Coastal Zone Management Goals

Coastal Zone Management Goals
<ul style="list-style-type: none"> • Ensure that the future maintenance of the Installation's coastal zone resources is performed in a manner that supports shoreline stabilization and the reduction of erosion and sedimentation into Delaware Bay, without compromising the mission. • Ensure that any USCG action that have reasonably foreseeable effect on any land or water use or natural resource of the coastal zone be consistent with the enforceable policies of the State's federally approved Coastal Management Program • Work with Federal, State, and local interests in preserving the shores of the Atlantic Coast through unifying policies, criteria, standards, methods, and processes for dealing with land and water use decisions of more than local significance. • Ensure that future maintenance of the TRACEN Cape May's coastal zone resources is performed in a manner that supports the diverse biological and hydrological functions unique and significant to coastal zones. • Reduce/control nutrient and sediment inputs into the watershed that degrades water quality. • Minimize non-point source pollution of both surface and groundwater in the watershed through the implementation of best management practices. • Maintain vegetation buffers along dunes.

4.5.1 CZM-1: Monitoring of the TRACEN Cape May Jetty

- **Concern:** TRACEN Cape May monitors the maintenance of the jetty located on the southeast side of the Installation protecting Cape May Harbor, however, the jetty has been built and is maintained by the USACE. Without proper functionality of this structure, the channel by which the USCG accesses the Atlantic Ocean would become silted and would require constant dredging. In addition, this jetty protects the Sensitive Species LMU by protecting the beaches from severe storm events. Proper maintenance of this structure is critical to both the mission of the USCG and to natural resources management at TRACEN Cape May.
- **Objective:** Ensure that the jetty is maintained to protect the Installation's natural resources in a manner consistent with the natural resources management guidelines presented in this INRMP, as well as to protect the mission of the USCG.
- **Actions:**
 1. Maintain the integrity of the riprap and stone to ensure the jetty is functioning properly. Coordinate maintenance activities with the Chief of the Environmental and Safety Office to ensure compliance with the Coastal Zone Management Act.
 2. Ensure that future management of the jetty minimizes erosion and sedimentation (E&S) at TRACEN Cape May.
- **Monitoring Criteria:** Annually examine the integrity of the jetty and report any findings to CAFRA program personnel.

4.5.2 CZM-2: Beach Replenishment of TRACEN Cape May Beaches

- **Concern:** NJDFW recognizes that beach replenishment has been both directly and indirectly beneficial to the maintenance of nesting habitat in all nesting zones. Continued beach replenishment will probably be necessary to maintain habitat in these areas. Concerns about beach replenishment, therefore, relate primarily to timing and avoiding disturbance and/or destruction of existing nests or chicks. Because all of the nesting beaches are currently included in an ongoing project with the USACE, the NJDFW will continue to work primarily with USACE and FWS to ensure the beach replenishment projects have no negative impact on beach nesting birds on TRACEN Cape May.
- **Objective:** Ensure that beach management replenishment activities do not significantly impact sensitive species or dune structure.
- **Actions:**
 1. Beach replenishment is conducted on the average every two years during the winter. Between 750,000 to 1,000,000 cu yards are blown onto the beach from offshore sources.
 3. Refer to annual surveys performed for the presence of seabeach amaranth to ensure that this plant is not impacted by beach replenishment.
 4. Continue to follow the *USCG TRACEN Cape May Beach Nesting Bird Management Plan* in Appendix D-6 of this INRMP. The conditions of this agreement have been added to goals, objectives, and actions found throughout this Plan.
- **Monitoring Criteria:** Monitoring criteria for these actions are established by the *USCG TRACEN Cape May Beach Nesting Bird Management Plan*. In addition to these provisions, the Chief of the USCG TRACEN Environmental Protection and Safety Section will ensure that seabeach amaranth is not present on areas affected by beach replenishment.

4.6 FISH AND WILDLIFE MANAGEMENT

The USCG has determined that TRACEN Cape May has sufficient habitat to warrant the preparation of this INRMP. While it is not a requirement of the USCG to prepare an INRMP for its Installations, the USCG has determined that TRACEN Cape May has sensitive species and habitats that would be significantly benefited through the implementation of this plan.

Some limited non-consumptive fish and wildlife management opportunities exist on the jetty and beach, but are limited due to proximity to the Sensitive Species LMU. There are no opportunities for consumptive wildlife uses due to limited habitat for game species and the proximity to Installation buildings. The limited variety of habitats present on the TRACEN (e.g., forested areas, beaches, riparian corridors) restricts the diversity of species found on the TRACEN. The limited amount of browse in this area limits the abundance of prey species and ultimately densities of predatory species. A summary of the Wildlife and Fisheries management goals are provided in Table 4-13.

Wildlife management is defined as manipulation of the environment and wildlife populations to produce desired objectives. Management may be performed in a manner that enhances biodiversity through the reestablishment of native habitats. Traditionally, wildlife management

was confined to large tracts of naturally vegetated land. The TRACEN possesses ample acreage for a variety of wildlife management activities.

Table 4-13. Summary of Wildlife and Fisheries Management Goals

Wildlife and Fisheries Management Goals
<ul style="list-style-type: none"> • Manage based on an ecosystem management approach, rather from a single species paradigm. • Employ a systematic approach to managing wildlife resources, utilizing a process that includes inventory, monitoring, modeling, management, assessment, and evaluation. • Minimize wildlife-related health risks, safety risks, and environmental damage. • Restore and maintain a diversity of wildlife in areas on the Installation where there will be no conflict with the mission. • Continue to remain in compliance with federal, state, and local laws and regulations governing fish and wildlife. • Maintain and involve partnerships with agencies and groups involved in wildlife management.

Wildlife population and habitat management on TRACEN Cape May will attempt to deter animals from foraging and/or roosting in areas near or adjacent to training areas; attract wildlife to areas away from these areas; and protect and conserve threatened and endangered species through habitat conservation at selected locations at the TRACEN. This approach has been chosen due to the relative abundance and variety of wildlife species present on TRACEN Cape May.

The fish and wildlife management topics of concern and associated goals and objectives are presented in the following subsections. A summary of the Fish and Wildlife Management Goals are presented in Table 4-13.

4.6.1 FWM-1: Need for Predator Control within Sensitive Species LMU

- **Concern:** Predation by mammals (e.g., red fox, raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), and birds (e.g. crows, grackles)), present a significant challenge to beach nesting bird management. As described in Section 4.3, predator controls have been in place to minimize predation on piping plovers. TRACEN Cape May initiates additional predator controls through trapping of red fox by USDA – Wildlife Services. A continual evaluation of the success of this program is required to ensure that measures are adequate to control nuisance fox in the area.
- **Objective:** Ensure that current depredation measures conducted by NJDFW are successful in minimizing predation of piping plover, least tern, and black skimmer.
- **Actions:**
 1. Conduct bi-weekly surveys for red fox signs in the Sensitive Species LMU during the nesting season to ensure that fox are not dispersing or feeding on the beach.
 2. Conduct monthly surveys for red fox and their signs during the non-breeding season to determine if the beaches are part of a fox's home range.

3. Summarize fox sightings and submit to NJDFW. Based on the summary of sightings, TRACEN Cape May works cooperatively with NJDFW to determine the number of fox present in the area and the extent of their home ranges. Based on these estimates, additional fox may need to be removed from the area.
4. Monitor the populations of feral cats (Figure 4-15) that may occur from the residential areas adjacent to the Installation. Should they become problematic, trapping and removal of these animals must occur.



Figure 4-15. Photograph of a Feral Cat Observed at TRACEN Cape May

- **Monitoring Criteria:** The data obtained from the various surveys will be used to evaluate fox densities and population levels. Modification of the number of fox to remove from the area will progress on an adaptive management approach and thus will be continually modified based on most current information and program success.

4.6.2 FWM-2: Need for Updated Biological Data

- **Concern:** The TRACEN Cape May supports numerous native species and habitats, as well as federally listed threatened and state-listed threatened and endangered species. There is a need for the collection and analysis of biological data for the Installation.
- **Objective:** Develop a Biological Survey to guide the surveying for, and management of plant and wildlife species and their habitats.

- **Actions:** 1. Develop a Biological Survey as a component plan to this INRMP to include the following:
 - a. Adaptive management strategies that enhance and protect native habitats that support the greatest variety of biodiversity on the Installation.
 - b. Management alternatives that ensure the perpetuation of the sensitive species that currently inhabit the Installation.
 - c. Detailed survey protocols and establish timelines for their completion to ensure that TRACEN Cape May personnel maintain the most current data available concerning the resources they are managing.
- 2. Schedule and develop procedures to conduct surveys to assess avian, mammalian, herptile, and insect species and populations. This should be conducted in conjunction with an assessment and mapping of the Installation's current vegetative cover. Comprehensive biological surveys of this nature conducted in cooperation with vegetative cover analysis will support the ecosystem management approach taken in this INRMP. The collection of this updated biological data will supplement the Biological Survey though providing the proper information to manage sensitive species by the ecosystem management approach described in Section 4.1.
- 3. Solicit information from the FWS, NJDFW, and other local experts.
- **Monitoring Criteria:** The management strategies developed as part of the Biological Survey must be reviewed before their incorporation to ensure their compatibility with the management guidelines and protocols of the FWS and NJDFWP. The data obtained from the various surveys will be used to evaluate sensitive species management goals and objectives, and will form the basis for their modification where necessary.

4.6.3 FWM-3: Management of Non-Game Wildlife Species

- **Concern:** Current management of nongame wildlife species, such as migratory birds, herptiles, small mammals, etc., which make up the key building blocks of the vertebrate component of the ecosystem, is handled mainly on a case-by-case basis.
- **Objective:** Rather than managing for single species, adaptive strategies will be implemented that manage habitats that benefit multiple species.
- **Actions:** 1. Improve habitat conditions for aquatic communities by establishing vegetative buffers around waterbodies and riparian corridors, maintaining healthy communities of riparian vegetation, minimizing training impacts, and preventing erosion and sedimentation.
- 2. Manage and protect wetlands on TRACEN Cape May to promote herptile reproduction and songbird habitat.
- 3. Construct and maintain additional nest boxes for cavity nesting birds adjacent to edge habitat, in open areas, and in forested lowlands. Outside

services (e.g., Boy Scouts) and conservation organizations will be sought out to assist in nest box construction and placement.

4. Continue to preserve snags and trees with nesting cavities.
5. Forested areas on the Installation will be identified for management of neotropical songbird populations.
6. Continue to promote the use of native trees as part of Installation landscaping activities.

4.6.4 FWM-4: Management of Migratory Birds

- **Concern:** Opportunities exist for implementing additional measures to provide habitat for migratory birds. Specifically, the purple martin (*Progne subis*) is a neotropical migrating songbird that over winters in Brazil, and returns to North America each year to complete its breeding cycle. Nesting habitat and displacement by invasive species such as the house sparrow (*Passer domesticus*) and European starling (*Sturnus vulgaris*) may be two of ecosystem components limiting their population levels. While provision of housing for a single species does not necessarily complement the ecosystem management strategy, all efforts to improve ecosystem functionality in the improved areas of the installation will be made.
- **Objective:** Improve ecosystem conditions in the improved areas of TRACEN Cape May by creating nesting habitat for purple martins.
- **Actions:**
 1. Implement an artificial nesting program with the assistance of local Boy Scouts or other service organizations. Technical support may be solicited from Mr. Allan Jackson (FWS-New Jersey Ecological Services Field Office (609) 646-9310); The Purple Martin Conservation Association, Edinboro University of Pennsylvania, Edinboro, PA, 16444, (814) 734-4420; or the Cape May National Wildlife Refuge manager, Howard Schlegel at 609-463-0994.
 2. See information contained in Appendix D-7 on placement and management of nesting structures.
 3. Control European starlings and house sparrows in nesting structures.

4.7 GROUNDS MAINTENANCE AND LAND MANAGEMENT

Installation grounds maintenance personnel perform most grounds maintenance activities at TRACEN Cape May. Normal grounds maintenance operations at TRACEN Cape May are focused on lawn care, drainage ditch maintenance, road maintenance, urban tree maintenance, landscaping maintenance, recreational facilities maintenance, pest management, and snow removal.

In the process of identifying grounds maintenance and land management actions, a list of goals (see Table 4-14) was generated that were used to create ecologically sustainable management objectives. The objectives, actions, and monitoring criteria designed to address specific management issues at TRACEN Cape May are presented below.

Table 4-14. Summary of Grounds Maintenance Management Goals

Grounds Maintenance Management Goals
<ul style="list-style-type: none"> • Lessen or avoid adverse effects from project activities to the overall ecosystem and its sensitive resources. • Make maximum use of regionally native plant species and avoid introduction of invasive, exotic species in re-vegetation and landscaping activities. • Reduce chemical usage, and maintenance inputs in terms of energy, water, manpower, equipment, and chemicals. • Ensure compliance with environmental legislation, regulations, and guidelines. • Control pest and invasive species on the Installation.

4.7.1 GM-1: Conversion of Improved and Semi-Improved Grounds on TRACEN Cape May

- **Concern:** Areas on TRACEN Cape May are currently managed as improved or semi-improved grounds, which increase maintenance costs and reduce habitat availability. While it is recognized that the improved areas are necessary for recruit training, some areas of the Installation could support conversation to unimproved or semi-improved conditions.
- **Objective:** Convert acreage of improved grounds to semi-improved and semi-improved grounds to unimproved grounds that will be compatible with the training mission. These areas support native vegetation and significantly reduce the operational costs of maintaining mowed grass. Reduction in the mowing frequency of these areas reduces operational costs by lowering man-hours, wear on machinery, and use of fuel. The use of native species in conservation plantings also minimizes the use of pesticides and herbicides required to maintain highly managed improved areas.
- **Actions:**
 1. In cooperation with the Cape May County Agricultural Extension Office, identify improved grounds for conversion to semi-improved acreage. Parcels should be chosen based on their current cover type, slope, and aspect to ensure that healthy grasslands can subsist with minimal physical manipulation to the site.
 2. Converted improved grounds will be managed as additional natural grassland vegetation restoration areas.
 3. Natural grassland vegetation restoration areas will be mowed annually to control woody vegetation growth.
 4. Converted semi-improved grounds will be managed in the same manner that adjacent unimproved acreage is managed (e.g., grasslands, forested, wetlands, etc.)
- **Monitoring Criteria:** Periodically investigate areas converted to semi-improved or unimproved acreage to assess the effects of the conversions on the mission and the health

and viability of the native vegetation. Evaluate the cost saving associated with this conversion.

4.7.2 GM-2: Use of Native Species during Re-vegetation and Landscaping Activities

- **Concern:** Non-native and invasive species may be introduced to the Installation during re-vegetation efforts and landscaping activities.
- **Objective:** Utilize grass and landscape plant species that are well adapted to the growing conditions in southern New Jersey. The use of native grass and landscape plant species will also discourage the introduction and spread of invasive plant species.
- **Action:**
 1. Continue to re-seed exposed soils after ground-disturbing activities using a native grass mix.
 2. Ensure that regionally native species are selected for landscape plantings.
- **Monitoring Criteria:** TRACEN Cape May natural resources management staff will monitor the use of native grasses to rehabilitate exposed soils and the use of regionally native species for landscape plantings.

4.7.3 GM-3: Need for Control of Invasive Vegetation

- **Concern:** Invasive species have been observed on the Installation, especially in the wetland areas. Common reed (*Phragmites australis*) is choking out native vegetation especially in the wetland areas of TRACEN Cape May. A brief description of the life history of this species and control methods are presented below this discussion.

Common Reed (*Phragmites australis*): Common reed is a tall perennial wetland grass ranging in height from three to thirteen feet. Strong, leathery, horizontal shoots, called rhizomes, growing on or beneath the ground surface, give rise to roots and tough vertical stalks. These stalks support broad sheath-type leaves that are one-half to two inches wide near the base, tapering to a point at the ends. The foliage is gray-green during the growing season, with purple-brown plumes appearing by late June. The plant turns tan in the fall and most leaves drop off, leaving only the plume-topped shoot. Big cordgrass (*Spartina cynosuroides*), a non-invasive species, is sometimes confused with common reed. It can be distinguished from common reed by its sparse flowering structure and long narrow leaves (VA NHP 2001). Common reed thrives in sunny wetland habitats and also grows along drier borders and elevated areas of brackish and freshwater marshes, along riverbanks and on lakeshores. The species is particularly prevalent in disturbed or polluted soils found along roadsides, ditches and dredged areas (VA NHP 2001).

While *Phragmites* is often considered an exotic invasive, it is a natural component of the natural vegetation of the east coast. Buried root stocks of *Phragmites* has been found in 3,000 year old salt marsh peat in Connecticut and in Colorado peat beds over 1,000 years old (Tiner 1998). *Phragmites* has an excellent nutrient uptake capacity and it is also important to stabilizing shorelines, preventing erosion, and temporarily storing flood

waters. Spread of *Phragmites* at TRACEN Cape May is an indication of high nutrient availability associated with the spoil piles on the southeast of the Installation.

Management is necessary when evidence indicates that *Phragmites* has spread, or is spreading and threatening the integrity of rare communities, invading the habitat of rare plants and/or interfering with the wildlife support function of wetlands. Cutting, burning, application of herbicides (Rodeo™), or water management schemes are possible control measures (ABI 2000). Cutting has been used successfully to control *Phragmites* if carried out annually for several years. Burning does not reduce the growing ability of *Phragmites* unless root burn occurs. Because a layer of soil, mud, and/or water usually covers the rhizomes, root burns seldom occur (ABI 2000). The use of herbicides, primarily Rodeo™, can be an effective control technique for *Phragmites*. Rodeo™ must be mixed with water and a surfactant which allows it to stick to and subsequently be absorbed. Application of Rodeo™ must take place after the tasseling stage when the plant is supplying nutrients to the rhizomes. When Rodeo™ is sprayed onto the foliage of aquatic weeds, it translocates into the roots. Rodeo™ intercepts essential plant growth processes, causing gradual wilting, yellowing, browning, and deterioration of the plant (ABI 2000).

- **Objective:** Develop and adopt proactive management measures to control the proliferation of invasive species.
- **Actions:**
 1. Identify areas where *Phragmites* occurs and develop specific management actions to target the populations of these species. Appendix H contains detailed information on methodology for controlling problematic *Phragmites* populations.
 2. Do not purchase or use invasive exotic species in landscaping or for land restoration or erosion control projects.
 3. For landscaping, use plants that are native to the local region as much as possible or those that are not known to be invasive.
 4. Notify adjacent land managers of invasive exotic plant occurrences and offer to assist in exotic plant removal projects.
- **Monitoring Criteria:** Monitor areas where invasive species are known to occur and where management measures have been implemented. Survey landscaped areas for the emergence of invasive, exotic species; planted non-native species; and implement control measures as necessary.

4.7.4 GM-4: Implementation of the Integrated Pest Management Plan

- **Concern:** Pest management objectives at TRACEN Cape May include the protection of real estate, control of potential disease vectors or animals of other medical importance, control of undesirable or nuisance plants and animals (including insects), and prevention of damage to natural resources.

Chapter 5 of the USCG Safety Manual (COMDTINST M5100.47) states that it is USCG policy to establish and maintain safe, effective, and environmentally sound integrated pest management programs to prevent or control pests and disease vectors that may

adversely impact readiness or military operations by affecting the health of personnel or damaging structures, material, or property. Integrated Pest Management should use mechanical, physical, cultural, biological, and educational methods to maintain pests at populations low enough to prevent undesirable damage or annoyance. Application of the least toxic chemical should be used as a last resort.

TRACEN Cape May implements an Integrated Pest Management Program (IPMP). This method of pest management involves four primary control strategies: mechanical and physical control (physical removal or exclusion of pests), cultural control (altering the environment to make it less suitable or attractive to the pest), biological control (use of other organisms that control the pest), and chemical control (use of pesticides and herbicides).

Protection of Real Estate. Protection of real estate from depreciation requires that animals (including insects) that seek refuge or other life necessities within human dwellings in a manner that causes damage to structures be controlled or prevented from entering the dwellings. Animals seek refuge inside human dwellings because the dwellings can provide warmth, protection from the elements, and/or materials or locations for nest building.

Many animals that are attracted to human dwellings include rodents, birds, and feral cats. However, those that enter and cause damage at TRACEN Cape May are not numerous. Rodents cause damage to structures and fixtures within buildings at TRACEN Cape May in their search for food, nesting materials or sites, warmth, or shelter. They can gain entry through small openings, but often enlarge these openings to suit their needs. They also use materials found within human dwellings, such as insulation for nesting material, and gnaw on loose or obstructive objects, such as electrical wiring or the outside corners of structures, in an effort to make their surroundings more suitable to themselves. The odors from their feces and urine also can be damaging to the value of the structures. Pest management at TRACEN Cape May includes control of these animals to prevent serious structural damage.

Control of Potential Disease Vectors or Animals of Other Medical Importance. The control of potential disease vectors or animals of other medical importance is important for the protection of human life and well-being. Animals that carry diseases or can cause other medical problems are attracted to human dwellings in search of food and shelter or egg-laying sites. They also might be transported to human dwellings by people themselves or by other animals. Transmission of disease to humans is passive, and nondisease medical problems (e.g., bites and stings) are the result of an animal's need for food or self-protection.

Flies are attracted to human dwellings by odors in their search for food and organic materials on which to lay eggs. Cockroaches establish themselves in human dwellings in search of food and shelter. Fleas are transported to human dwellings by other animals and might establish themselves in carpeting or furniture if a continuing source of food (i.e., blood) is available. Birds might seek nesting sites in protected locations on the outside of buildings and occasionally in protected locations inside buildings. Their nests can harbor disease-carrying organisms. All of these types of animals, although they themselves are not harmful to humans, can potentially transmit diseases to humans. Their establishment in human dwellings or in close proximity to humans must, therefore, be prevented or controlled to the extent that the likelihood of disease transmission is very small.

Ticks attach themselves to humans when the latter pass through vegetation where the ticks are located. Human blood is a source of food to ticks. Ticks that carry disease-causing organisms internally can pass the organisms directly to humans through their bites. Lyme disease is of particular concern in this region of the country. Rodents and bats can carry diseases internally and pass them to humans through bites that might occur if the animals are disturbed or threatened. Rodent nests and rodent and bat feces also can harbor other disease-carrying organisms or disease vectors.

Bees and wasps that nest on or near human dwellings, a few spiders (e.g., black widow [Figure 4-16]), and snakes will sting or bite humans when disturbed or threatened. Generally, these injuries are only painful and do not cause long-term problems, although some individuals might be sensitive to the stings of certain insects, and the bites of poisonous snakes can be dangerous.



Figure 4-16. Photograph of a Black Widow Observed at TRACEN Cape May.

Mosquitoes are also a common vector of pathogens in the region. Mosquitoes (*Culex pipiens*) carry the West Nile virus. In 2000, the New Jersey State Mosquito Control Commission funded a program whereby chickens were used as sentinels to determine if virus was in the area. In cooperation with the Agricultural Experiment Station at Rutgers University, the New Jersey Department of Agriculture, and the county mosquito control programs; each New Jersey County had at least one flock of three chickens put in place to act as sentinels for virus spread. The chickens were tested bi-weekly to determine where the virus was spreading through the state. Chickens were thought to be good indicators for the virus due to the fact that a simple blood test can reveal if West Nile Virus was present. Unlike other free-flying migratory birds, these chickens are retained, in pens. As residents of a specific area, blood samples taken from them would have indicated the

presence or absence of the virus in that area. Chickens do not die from the West Nile Virus, but it can be detected in their blood. Figure 4-17 is a photograph of the mosquito virus surveillance box which contains chickens at TRACEN Cape May.



Figure 4-17. Mosquito Virus Surveillance Chicken Pen

Pest management activities at TRACEN Cape May to control these animals are necessary to prevent the outbreak and spread of disease at the Installation because disease can lower the well-being and morale of Installation personnel, and a serious outbreak would hinder accomplishment of the mission.

Control of Undesirable Nuisance Plants and Animals (including insects). Animals that are nuisances when in human dwellings are controlled to make the dwellings more enjoyable to inhabit, but these animals generally do not pose any real threat to humans. Spiders, ants, earwigs, crickets, and stray bees, wasps, or hornets that gain entry to dwellings can be nuisances. Moths or beetles might create a nuisance if they establish themselves in stored food products, and some species can damage fabrics. Birds that nest on dwellings or that search for food in the materials of dwellings (i.e., woodpeckers, pigeons, and English house sparrows) are sometimes a nuisance. Stray dogs and cats, nonpoisonous snakes, skunks, and raccoons can become nuisances if they become accustomed to the presence of humans or to finding food near human dwellings, cause damage to grounds around dwellings, or gain entrance to dwellings.

Some animals mostly constitute a nuisance but have the potential to cause other problems, such as structural damage or the spread of disease. These animals include

cockroaches, flies, fleas, some ants, rodents, and bats. The problems associated with these animals are discussed elsewhere in this section.

Most animals that are no more than nuisances only need to be controlled when their presence is substantial enough that they affect morale or the comfort of dwellings, or they present a potential danger to Installation personnel. Their presence might be seasonal, and they can generally be controlled on a case-by-case basis. A plan for their control is generally not necessary.

Prevention of Damage to Natural Resources. Prevention of damage to natural resources is an important objective of pest management. Natural resources damage can result from infestations of damaging insects or insect larvae, from overgrowths of vegetation where natural resources management concerns demand their removal, and from invasions of noxious or exotic plant species that displace natural and native vegetation.

EO 13112, *Invasive Species*, requires all Federal agencies to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause. *Phragmites* is the most predominant invasive plant species on the Installation.

- **Objective:** An Integrated Pest Management Plan will be implemented.
- **Actions:**
 1. Continue implementation of the Integrated Pest Management Plan at TRACEN Cape May.
 2. Methods that can be used to prevent the destruction of the structures at TRACEN Cape May include the following:
 - a) Prevent the entry of pests into buildings by closing holes, cracks, and crevices.
 - b) Apply tracking powder or other poisons to eliminate rodents that have established themselves in building interiors.
 - c) Trap and remove feral cats.
 - d) Trap and remove raccoons and other burrowing mammals that pose a threat to building or infrastructure.
 3. Management measures to control pests posing a potential threat to human health include the following:
 - a) Continue the use of free range guinea hens (Figure 4-18) to control populations of ticks in the grassland and wetland areas of the Installation. While there has been no quantitative study of its success at TRACEN Cape May, qualitative observations have shown positive results.
 - b) Ensure proper sanitation and housekeeping to remove any food sources that might be attractive to interior pests (e.g., cockroaches, ants, flies).



Figure 4-18. Guinea Hens Used to Control Tick Infestations at TRACEN Cape May

- c) Practice proper personal hygiene, wear proper clothing, and wear repellants to reduce or eliminate problems associated with sucking insects (fleas, ticks, and mosquitoes).
- d) Remove the excrement of bats and birds from underneath their roosts to prevent the growth of harmful bacteria.
- e) Eliminate artificial breeding and larval habitat for flies and mosquitoes.
- f) Destroy the nests of bees and wasps where their locations present a hazard to people.
- 4. General management measures that should be used to control nuisance pests include the following:
 - a) Capturing individual large animals (e.g., raccoons, skunks) for removal or euthanasia (see Figures 4-19 and 4-20).
 - b) Using snap traps and glue boards to trap rodents
 - c) Placing pesticide baits along the paths of ants and cockroaches.
- 5. Perform annual surveys to determine the presence of the invasive or noxious plant species.
- 6. Incremental updates to the plan will be conducted every five years to ensure that the plan reflects changes in pest populations and current management issues.



Figure 4-19. Photograph of a Striped Skunk Captured and Released during Problem Species Control



Figure 4-20. Photograph of a Raccoon Captured and Released during Problem Species Control

- **Monitoring Criteria:** Monitor pest and invasive species populations. Track usage of active ingredients and man-hours spent controlling pest and invasive species during implementation to ensure that the management strategies are sufficient.

4.8 URBAN FORESTRY

TRACEN Cape May has made a considerable investment in beautifying the Installation by planting ornamental trees throughout the improved areas of the TRACEN, and by conservation planting in other areas of the TRACEN. The Installation possesses a significant urban forestry resource that must be managed properly. As mentioned previously, no commercial forestry resources are present at TRACEN Cape May. Table 4-15 identifies the urban forestry goal for this INRMP.

Table 4-15. Urban Forestry Management Goal

Urban Forestry Goal
<ul style="list-style-type: none"> • Ensure the orderly and scientific management of the urban trees on the Installation to the extent compatible and consistent with the missions of the USCG and TRACEN Cape May. • Protect the real estate investment of the U.S. Government from unnecessary depreciation and/or depletion of urban forestry resources.

4.8.1 FOR-1: Management of TRACEN Cape May Urban Forest Resources

- **Concern:** TRACEN Cape May possesses a substantial urban forestry resource that requires continual management.
- **Objective:** Management of the urban trees throughout the Installation is essential. These areas will be managed primarily for aesthetics, recreation, and compatible wildlife preservation, and for visual and noise buffering capacity. It is expected that this can be accomplished largely by removal of trees that are dead, dying, diseased, damaged, or that pose safety hazards, and by occasional brush removal. Trees should be selected which are native to the region and require minimal amounts of maintenance.
- **Actions:**
 1. Conduct an annual review of the TRACEN Cape May ornamental tree plantings.
 2. Develop and maintain an urban forestry database to catalogue existing trees and provide a schedule for their maintenance. Such a database will be useful in assessing the diversity of urban tree species to gauge the selection of species for future plantings.
 3. Continue to manage urban forest resources for disease, damage, and replacement.
- **Monitoring Criteria:** Ensure that urban forest resources are managed in accordance with the goal established in this section. Specific changes to management of urban tree species should be followed based on annual recommendations. Replace dead or dying trees with same species or evaluate the replacement with native species. Discern the causative factor for the dead tree.

4.8.2 FOR-2: Lack of Data on Urban Trees and Conservation Plantings

- **Concern:** There is a lack of information concerning the health and viability of the urban tree resources on TRACEN Cape May.
- **Objective:** To inventory urban tree and conservation planting health, viability, and survivability. This data will be entered into a GIS database to track the progress of the Installation's urban forestry program.
- **Actions:**
 1. Conduct an Urban Tree Survey within the improved and landscaped portion of the Installation.
 2. Assess the viability and survivability of the conservation plantings throughout TRACEN Cape May.
 3. Collect data for "stand-alone" urban trees including diameter at breast height, form, condition, height, location (latitude and longitude), and species type. Describe any problems associated with the individual trees and include activities to resolve these problems. Tag each urban tree and assign a unique identification number.
 4. Enter data collected for "stand-alone" urban trees into an Urban Tree GIS Database that will provide TRACEN Cape May with an effective, interactive management tool to track the progress of the Installation's urban forestry program. This will allow communication between staff about management of urban forestry resources through creation of maps from the GIS database
- **Monitoring Criteria:** Surveying urban forest resources periodically will provide the basis for maintaining an up-to-date GIS database. It will also alert Installation personnel to problems associated with urban forest resources.

4.9 OUTDOOR RECREATION AND PUBLIC ACCESS

Outdoor recreation opportunities exist at TRACEN Cape May that are linked to both the training mission at TRACEN Cape May and the leisure time of TRACEN Cape May residents and employees. The level of enjoyment that is derived from these activities is directly related to the quality of the natural resources present on TRACEN Cape May. Maintaining a quality outdoor recreation program is dependent on proper management of natural resources and efficient program administration and oversight. Recreation opportunities must be evaluated beyond the normal recreation opportunity spectrum (ROS) used to evaluate recreation potential in the private sector. The ROS uses measures of opportunities along with satisfaction and perceived carrying capacity to evaluate all available opportunities. The unique characteristics of USCG operations make the evaluation criteria more specific and the spectrum of opportunities narrower. The outdoor recreation and public access topics of concern and associated goals and objectives are listed in the following subsections.

People and social uses/needs are an integral part of ecosystem management. The outdoor recreation program is based on providing quality experiences while sustaining ecosystem integrity. Activities that have a direct effect on species populations such as shorebird management, or soil erosion from trails, will be monitored to determine effects, and adaptive

management (i.e., water bars on trails) incorporated to mitigate negative impacts. Special consideration will be given to protecting critical areas from negative impacts due to outdoor recreation or ecosystem management activities. From these general outdoor recreation management philosophies have been developed a series of goals and objectives which have been used to identify management issues and actions to address them. A summary of the goals used for managing outdoor recreation resources is provided in Table 4-16.

Table 4-16. Summary of Outdoor Recreation Management Goals

Outdoor Recreation Management Goals
<ul style="list-style-type: none"> • Provide quality outdoor recreation experiences while sustaining ecosystem integrity. • Ensure that outdoor recreation activities are not in conflict with mission priorities.

4.9.1 OR/PA-1: Limitation of Access into the Sensitive Species LMU

- **Concern:** Inadvertent trespass onto TRACEN Cape May has been problematic in the past, especially during the nesting season due to disturbance of beach nesting birds. As described in Section 4.3, signage and symbolic fencing is in place, but fencing is problematic during low tide. In addition, personnel require an understanding of the hazards to the natural resources and to the mission of the USCG due to the potential damage to this ecosystem. USCG TRACEN Cape May provides beach access to the Cape May public beach from the SW gate for USCG personnel. Beach tags are subsidized from Moral Welfare and Recreation account. Access is allowed on the condition that they do not enter sensitive area LMU.
- **Objective:** Ensure that the Sensitive Species LMU is not seen as a resource for outdoor recreation.
- **Action:**
 1. Continue to provide information to personnel, their dependents, and visitors regarding the importance of controlling beach access.
 2. Small groups are allowed access to the beach three to four times per year for educational opportunities. Small groups of ten to fifteen high school students or younger are granted access for a briefing on beach ecology, endangered species, etc. The access is controlled and under the direction of the Environmental Protection & Safety Section. Locations are chosen so as not to impact endangered species nesting success.
- **Monitoring Criteria:** Based on the number of violations in the Beach Access Violation Log (Appendix I) additional focus may need to be placed on providing information regarding the importance of beach closure to outdoor recreation.

4.9.2 OR/PA-2: Public Perception of TRACEN Cape May

- **Concern:** The public's perception of the Installation programs within and among current and future neighboring communities is an important factor in the successful implementation of future programs on TRACEN Cape May.

- **Objective:** It is imperative that the Installation continues with a rigorous public affairs campaign. This campaign will include the development and implementation of community information and involvement strategies to reinforce the positive effect of TRACEN Cape May's presence in the region. These strategies range from individuals volunteering and providing assistance within the local community to hosting regional events from the local community. TRACEN Cape May personnel have the opportunity to participate in numerous local activities, and provide resources and manpower to support and enhance the community's "quality of life."
- **Action:**
 1. Personnel can volunteer for community service events, including outreach for the homeless and community cleanups.
 2. The INRMP Working Group will work with the USCG public affairs office to develop information materials (i.e., pamphlets) to promote the positive aspects of TRACEN Cape May.
- **Monitoring Criteria:** Analyze the information gathered as part of the review of the questionnaires distributed after each organized event at the Installation, and adjust public outreach efforts as appropriate.

4.10 GEOGRAPHIC INFORMATION SYSTEMS

TRACEN Cape May has digitized maps of the Installation that were prepared in conjunction with master planning activities in a Computer Aided Drafting (CAD) format. These same programs were used to generate digital maps as part of this INRMP. Currently, TRACEN Cape May personnel do not use a GIS application to aid in making management decisions on the TRACEN. Due to the habitat and land use features on the Installation, TRACEN Cape May should employ the use of a Geographic Information System (GIS). When all facility maps and databases are incorporated into the GIS application, this system will provide the opportunity for TRACEN Cape May personnel to accurately and completely analyze the potential effects of all future projects and activities. Managers can implement the capabilities of a GIS to watershed, wetlands, wildlife, and various other natural resource management applications. The goals related to GIS management are summarized in Table 4-17.

Table 4-17. Summary of GIS Management Goals

GIS Management Goals
<ul style="list-style-type: none"> • Acquire GIS and train personnel on its use. • Collect, store, and maintain data about historical conditions, trends, and current status for critical indicators of ecological integrity and sustainability. • Use GIS information as benchmarks for developing future natural resources management goals and objectives.

4.10.1 GIS-1: Acquisition of a GIS

- **Concern:** As mentioned previously, TRACEN Cape May currently has digitized maps of the Installation that were prepared in conjunction with this INRMP. However, there is no relative database information incorporated with these figures. Use of a GIS would

greatly facilitate management decisions by combining geographic information with database information related to natural resources and environmental compliance information.

- **Objective:** Develop a GIS and digitize Installation's maps, databases, and other resources.
- **Action:**
 1. TRACEN Cape May will acquire a GIS.
 - a) After all Installation maps and databases are incorporated into the GIS application, this system will provide the opportunity for TRACEN Cape May personnel to accurately analyze the potential effects of all future projects and activities.
 - b) The GIS is required as a tool to map known natural resources, monitor problematic areas, develop solutions to natural resource problems, analysis of new projects/operations, and completion of other projects listed in this INRMP.
- **Monitoring Criteria:** Track the acquisition of a GIS and the development of GIS layers and ensure that database information is organized in a manner which facilitates easy and accurate analyses.

4.10.2 GIS-2: Need for Trained Personnel to Operate and Implement GIS Applications

- **Concern:** With the intended development of the GIS, there is a need for personnel to be trained to operate and effectively implement the newly acquired application.
- **Objective:** Train TRACEN Cape May staff to customize and conduct ArcView analyses.
- **Action:**
 1. The INRMP Working Group will select several TRACEN Cape May personnel who will be trained in the use and implementation of GIS.
 - a) Train as many personnel as possible in the use of the GIS application to ensure its successful implementation.
 - b) The contractor responsible for developing the user-friendly interface and initial digitization efforts should provide a series of training classes to properly instruct Range personnel on the use of the GIS developed for the TRACEN (also see Topic No. GIS-1).
- **Monitoring Criteria:** Progress will be measured by attendance of classes / seminars that provide ArcView instruction.

4.11 NATURAL RESOURCES CONSTRAINTS TO THE MISSION AT TRACEN CAPE MAY

Some of the natural resources topics of concern mentioned in the previous sections could have an adverse impact on the Installation's mission or future planning operations. The potential negative impacts could range from a delay in the construction of new buildings to a delay of training. These issues should be clearly identified and a schedule for their resolution should be prepared. The natural resources constraints to TRACEN Cape May planning and mission are presented in the following paragraphs. Several of these concerns are further detailed in Appendix C (Composite Natural Resources Constraints).

- TRACEN Cape May personnel require the appropriate guidance on an ecosystem management approach to natural resources management. Successful implementation of ecosystem management protocols will ensure that the mission is not compromised due to violations of natural resources law and regulations.
- There is problem of unauthorized access to the Installation via Cape May Beach access into TRACEN Cape May beaches. Signage and fencing is present on the southwest beach access, but during low tide, the signs are far away from the low water line and can not be seen. Signs can not be posted at the low tide mark, as they tend to wash away. Not only is the beach area managed as the Sensitive Species LMU, it also represents an area that individuals could potentially gain access to the Installation.
- Nesting populations of piping plover (federally threatened, state endangered), black skimmer (state endangered), and least tern (state endangered) are known to occur on the beaches of TRACEN Cape May. Strict guidelines are in place that controls the management of these species. Management of these populations is a priority to the mission of the USCG.
- Under the Endangered Species Act, any potential activity that could impact the success of the beach nesting birds or other threatened or endangered species must go through a consultation process with the FWS. Failure to follow this process could violate federal law and significantly delay and/or halt projects.
- Surveys determined that isolated patches of seabeach amaranth (*Amaranthus pumilus*) occur as far south as Upper Township, Cape May County, New Jersey. This plant has the potential to occur at the TRACEN in future years. The USCG obligations of Section 7(a)(1) of the Endangered Species Act apply to seabeach amaranth. FWS anticipates a southern expansion of this species into new areas which could potentially include TRACEN Cape May. Occurrence of this species could limit use of areas if found outside of the Sensitive Species Land Management Unit.
- Although 27 wetlands have been mapped at TRACEN Cape May, confirmation of the location and extent of the freshwater wetlands is necessary to ensure that inadvertent violations do not occur in the future. Confirmation is also necessary to ensure that appropriate permits are obtained before encroachments into areas occur.
- Without proper functionality of the southern jetty, the channel by which the USCG accesses the Atlantic Ocean would become silted and would require constant dredging. In addition, this jetty protects the Sensitive Species LMU by protecting the beaches from severe storm events. Proper maintenance of this structure is critical to

both the mission of the USCG and to natural resources management at TRACEN Cape May.

- Pest management objectives at TRACEN Cape May include the protection of real estate, control of potential disease vectors or animals of other medical importance, control of undesirable or nuisance plants and animals (including insects), and prevention of damage to natural resources. Control of these species allows accomplishment of the mission without destruction of property or negative effects to human health or welfare.

5. INRMP IMPLEMENTATION

The purpose of this section is to present a road map for the implementation of specific management goals and objectives for several natural resources subject areas. Table 5-2 summarizes the management actions identified in Sections 4.1 through 4.11 and proposes priorities for their implementation. The taskings proposed for this INRMP are extremely aggressive, and may not be accomplished within the established timelines due to a number of factors (e.g., budget and manpower constraints, wartime taskings, etc.). However, their importance to the proper management of the Installation's natural resources cannot be understated. Therefore, the management actions presented in Table 5-2 should be modified as part of the annual review of this INRMP by the INRMP Working Group to ensure that these taskings are continually emphasized and accomplished when practicable. Changes to be made in following revisions of the INRMP should be noted on the INRMP Update Form and logged into the Master INRMP Update Log. Both of these forms are located in Appendix M. Additional space has been provided under each resource area heading to allow for the addition of management actions developed during the lifecycle of this INRMP.

The funding for the preparation and implementation of this INRMP and the associated NEPA analysis and documentation is a high priority. However, the reality is that not all of the projects and programs identified in this INRMP will receive immediate funding. As such, these programs and projects have been placed into three priority-based categories: **(1)** high priority projects, **(2)** important projects, and **(3)** projects of lesser importance. The prioritization of the projects is based on need, and need is based on a project's importance in moving the natural resources management program closer towards successfully achieving its goal.

This INRMP reflects the commitment set forth by TRACEN Cape May to conserve, protect, and enhance the natural resources present on the Installation. This INRMP is the final plan that will direct the natural resources management at TRACEN Cape May from FY 2003 through FY 2007. An ecosystem approach was used to develop the management measures for each resource area. Implementation of the management measures will maintain, conserve, and enhance the ecological integrity of the Installation and the biological communities inhabiting the Installation. In addition, the natural resources management measures described in this Plan will protect the TRACEN Cape May ecosystems and their components from unacceptable damage or degradation and identify and restore previously degraded habitats. The estimated man hours to oversee the implementation of the INRMP are shown in Table 5-1.

Natural resource and land use management issues are not the only factors contributing to the development and implementation of the INRMP. Installation management and other seemingly unrelated issues affect the implementation of this Plan. It is of utmost primacy to the implementation of this INRMP that TRACEN Cape May personnel take "ownership" of the Plan (i.e., individual or organizational primary responsibility to implement the INRMP), to provide the necessary resources (i.e., personnel and equipment), and to allocate the appropriate funding to enact the plan. It is extremely important that an INRMP Working Group be established to aid in the continued development and commit to the implementation of this INRMP. The INRMP Working Group shall be made up of the key TRACEN Cape May personnel, and will assume an oversight role to ensure the effective implementation of this Plan. Top- and middle-level management representation, as well as representation from several individuals with day-to-day Installation field experience will provide the INRMP Working Group with the leadership and structure necessary for the successful implementation of this INRMP.

Table 5-1. Estimated Total Oversight Man Hours of INRMP Implementation

INRMP Funding Category	Oversight Estimated Man Hours
Plan Implementation and Management	496
Ecosystem Management	440
Off-Base Land Use	448
Threatened and Endangered Species	1,720
Wetlands and Floodplains	820
Coastal Zone Management	80
Fish and Wildlife Management	1,160
Grounds Maintenance and Land Management	1,280
Urban Forestry	120
Outdoor Recreation and Public Access	216
Geographical Information System	168
TOTAL	6,948

As stated in Section 1.4, this INRMP is a “living” document that is based on several short-, medium-, and long-term planning goals. Short-range goals include activities that are planned to occur in 0 to 5 years, while medium-range goals include activities in a 6- to 10-year period. Long-range goals are usually scheduled beyond 10 years. (A majority of the goals and objectives discussed in this INRMP are based on short-term natural resources management goals.) Because an INRMP is a “living” document, goals may be revised over time to reflect evolving environmental conditions. In addition, medium- and long-range planning goals may eventually become short-range activities that also require implementation.

Currently, TRACEN Cape May personnel are responsible for implementing programs at the TRACEN other than the natural resources management responsibilities that will be necessary to implement this INRMP. Additional sources of temporary labor, hired with term limitations, could be utilized to augment current staff, such as seasonal employees (e.g., grounds maintenance summer hires). Implementation of a number of projects discussed in this INRMP will require active outside assistance. The outside assistance may come from state and Federal agencies, private consortiums and organizations, universities, and contractors. Using these resources is the most efficient and cost-effective method for acquiring expertise on a temporary basis. Some parties will be reimbursed for their assistance, as agreed based on the Memorandum of Understanding and contractual agreements, whereas others will supply their assistance in accordance with cooperative agreements. The INRMP Working Group should assess the level of additional resources necessary to fully implement this Plan during the INRMP annual review process (as described in this section), and determine the extent to which outside assistance will be required.

Action Number	Natural Resource Area Actions	TRACEN Cape May Labor hours						Equipment and Supply Funding						Contractor Funding						Total Funding						Project Total	Date Completed
		FY 03	FY 04	FY 05	FY 06	FY 07	TBD FY	FY 03	FY 04	FY 05	FY 06	FY 07	TBD FY	FY 03	FY 04	FY 05	FY 06	FY 07	TBD FY	FY 03	FY 04	FY 05	FY 06	FY 07	TBD FY		
Plan Implementation																											
PI-1	Establish an INRMP Working Group and provide oversight	80	40	40	40	40		\$250												\$250	\$0	\$0	\$0	\$0	\$0	\$250	
PI-2	Annually prepare budget to implement next fiscal year's taskings	32	32	32	32	32														\$0	\$0	\$0	\$0	\$0	\$0	\$0	
PI-3	Develop SOW and IGCE for complete revision of the INRMP				40															\$0	\$0	\$0	\$0	\$0	\$0	\$0	
PI-4	Oversee complete update and revision of TRACEN Cape May INRMP					56						\$40,000								\$0	\$0	\$0	\$0	\$40,000	\$0	\$40,000	
TOTAL		112	72	72	112	128	0	\$250	\$0	\$0	\$0	\$40,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$250	\$0	\$0	\$0	\$40,000	\$0	\$40,250	
Ecosystem Management																											
ES-1	Develop and maintain ecosystem stressors matrix	24	24	24	24	24														\$0	\$0	\$0	\$0	\$0	\$0	\$0	
ES-2	Include ecosystem management principles in land management projects	40	40	40	40	40														\$0	\$0	\$0	\$0	\$0	\$0	\$0	
	Develop ecosystem management educational materials	40	24		24			\$100	\$100		\$100									\$100	\$100	\$0	\$100	\$0	\$0	\$300	
	Distribute ecosystem management educational materials		16		16															\$0	\$0	\$0	\$0	\$0	\$0	\$0	
TOTAL		104	104	64	104	64	0	\$100	\$100	\$0	\$100	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$100	\$100	\$0	\$100	\$0	\$0	\$300	
Off-Base Land Use																											
OB-1	Provide weekly briefing to security regarding status of breeding birds	40	40	40	40	40														\$0	\$0	\$0	\$0	\$0	\$0		
	Develop and distribute educational materials regarding beach closure	16	16		16															\$0	\$0	\$0	\$0	\$0	\$0	\$0	
OB-2	Establish and maintain unauthorized access log	8	8	8	8	8														\$0	\$0	\$0	\$0	\$0	\$0	\$0	
	Erect additional signage to inform public and personnel of beach closure	32	32	32	32	32			\$500		\$500									\$0	\$500	\$0	\$500	\$0	\$0	\$1,000	
TOTAL		96	96	80	96	80		\$0	\$500	\$0	\$500	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$500	\$0	\$500	\$0	\$0	\$1,000	
Threatened and Endangered Species																											
TE-1	Monitor and control access to the Sensitive Species LMU	40	40	40	40	40														\$0	\$0	\$0	\$0	\$0	\$0	\$0	
TE-2	Conduct beach nesting bird monitoring and management	200	200	200	200	200														\$0	\$0	\$0	\$0	\$0	\$0		
TE-3	Ensure projects are in compliance with ESA	24	24	24	24	24														\$0	\$0	\$0	\$0	\$0	\$0	\$0	
TE-4	Conduct habitat improvements in the Sensitive Species LMU	40	80	40	40	40														\$0	\$0	\$0	\$0	\$0	\$0	\$0	
TE-5	Conduct yearly survey for seabeach amaranth	32	32	32	32	32														\$0	\$0	\$0	\$0	\$0	\$0	\$0	
TOTAL		336	376	336	336	336		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Wetlands and Floodplains																											
WT-1	Develop generic SOW for the identification and delineation of freshwater wetlands for use when triggered by potential wetlands encroachments. Individual IGCEs will vary dependent upon survey acreage	40																		\$0	\$0	\$0	\$0	\$0	\$0	\$0	
	Delineate freshwater wetlands prior to potential wetland encroachments	40	40	40	40	40													\$12,000	\$0	\$0	\$0	\$0	\$0	\$12,000	\$0	
	Develop and maintain the wetlands inventory database	120	20	20	20	20														\$0	\$0	\$0	\$0	\$0	\$0	\$0	
WT-2	Develop SOW and IGCE for the development of a Freshwater Wetlands Function and Value Assessment / Management Plan						40													\$0	\$0	\$0	\$0	\$0	\$0	\$0	
	Negotiate contract to develop and oversee the preparation of Freshwater Wetlands Functions and Values Assessment / Management Plan						80											\$28,000	\$0	\$0	\$0	\$0	\$0	\$28,000	\$0		
	On an annual basis, implement protocols established as part of the Freshwater Wetlands Management Plan						24													\$0	\$0	\$0	\$0	\$0	\$0	\$0	
WT-3	Develop and disseminate informational materials on wetland locations	120	40	20	20	20	20	\$1,000	\$500	\$500	\$500	\$500								\$1,000	\$500	\$500	\$500	\$500	\$0	\$3,000	
	Develop and use a wetlands questionnaire			80	40	40				\$250	\$100	\$100								\$0	\$0	\$250	\$100	\$100	\$0	\$450	
TOTAL		320	100	160	120	120	164	\$1,000	\$500	\$750	\$600	\$600	\$0	\$0	\$0	\$0	\$0	\$0	\$40,000	\$1,000	\$500	\$750	\$600	\$600	\$40,000	\$3,450	

Table 5-2. INRMP Implementation Table

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Action Number	Natural Resource Area Actions	TRACEN Cape May Labor hours						Equipment and Supply Funding						Contractor Funding						Total Funding						Project Total	Date Completed
		FY 03	FY 04	FY 05	FY 06	FY 07	TBD FY	FY 03	FY 04	FY 05	FY 06	FY 07	TBD FY	FY 03	FY 04	FY 05	FY 06	FY 07	TBD FY	FY 03	FY 04	FY 05	FY 06	FY 07	TBD FY		
Coastal Zone Management																											
CZM-1	Ensure integrity of seawall	8	8	8	8	8														\$0	\$0	\$0	\$0	\$0	\$0	\$0	
	Ensure that future management of seawall is not contributing to E&S	8	8	8	8	8														\$0	\$0	\$0	\$0	\$0	\$0	\$0	
TOTAL		16	16	16	16	16	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Fish and Wildlife Management																											
FWM-1	Conduct bi-weekly predator surveys during nesting season	48	48	48	48	48														\$0	\$0	\$0	\$0	\$0	\$0	\$0	
	Conduct monthly surveys for red fox signs during non-breeding season	16	16	16	16	16														\$0	\$0	\$0	\$0	\$0	\$0	\$0	
	Provide yearly summary of fox population to NJDFW	24	24	24	24	24														\$0	\$0	\$0	\$0	\$0	\$0	\$0	
FWM-2	Continually assess wildlife populations	20	20	20	20	20														\$0	\$0	\$0	\$0	\$0	\$0	\$0	
	Develop SOW and IGCE for a biological resources survey		40																	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
	Develop a biological resources survey			80												\$40,000				\$0	\$0	\$40,000	\$0	\$0	\$0	\$40,000	
FWM-3	Manage wetlands and vernal pools to promote wildlife habitat.		40		40															\$0	\$0	\$0	\$0	\$0	\$0	\$0	
	Construct and maintain additional nest boxes for cavity nesting birds		120	40	40	40			\$500	\$150	\$150	\$150								\$0	\$500	\$150	\$150	\$150	\$0	\$950	
	Identify forested areas for management of neo-tropical songbirds	60		60		60														\$0	\$0	\$0	\$0	\$0	\$0	\$0	
TOTAL		168	308	288	188	208	0	\$0	\$500	\$150	\$150	\$150	\$0	\$0	\$0	\$40,000	\$0	\$0	\$0	\$0	\$500	\$40,150	\$150	\$150	\$0	\$40,950	
Grounds Maintenance and Land Management																											
GM-1	Convert improved grounds to semi-improved acreage	80	100	60	60	60														\$0	\$0	\$0	\$0	\$0	\$0	\$0	
GM-2	Continue to ensure that exposed soils are re-seeded	40	40	40	40	40		\$500	\$500	\$500	\$500	\$500								\$500	\$500	\$500	\$500	\$500	\$0	\$2,500	
GM-2	Implement Integrated Pest Management Plan	80	80	80	80	80		\$750	\$750	\$750	\$750	\$750								\$750	\$750	\$750	\$750	\$750	\$0	\$3,750	
GM-3	Perform annual surveys to quantify invasive or noxious plant species	24	24	24	24	24														\$0	\$0	\$0	\$0	\$0	\$0	\$0	
GM-4	Continue implementation of the Integrated Pest Management Plan	40	40	40	40	40		\$1,000	\$1,000	\$1,000	\$1,000	\$1,000								\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$0	\$5,000	
TOTAL		264	284	244	244	244	0	\$2,250	\$2,250	\$2,250	\$2,250	\$2,250	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,250	\$2,250	\$2,250	\$2,250	\$2,250	\$0	\$11,250	
Urban Forestry Management																											
FOR-1	Conduct annual review of the Installation ornamental tree plantings	24	24	24	24	24								\$1,200	\$1,200	\$1,200	\$1,200	\$1,200		\$1,200	\$1,200	\$1,200	\$1,200	\$1,200	\$0	\$6,000	
	Develop SOW and IGCE for a urban forestry database						40													\$0	\$0	\$0	\$0	\$0	\$0	\$0	
	Develop and maintain an urban forestry database						80												\$15,000	\$0	\$0	\$0	\$0	\$0	\$15,000	\$0	
FEM-2	Conduct an Urban Tree Survey to collect the baseline data needed to develop and maintain an urban forestry database						80												\$12,500	\$0	\$0	\$0	\$0	\$0	\$12,500	\$0	
	Enter baseline data into urban forestry database						120													\$0	\$0	\$0	\$0	\$0	\$0	\$0	
TOTAL		24	24	24	24	24	320	\$0	\$0	\$0	\$0	\$0	\$0	\$1,200	\$1,200	\$1,200	\$1,200	\$1,200	\$27,500	\$1,200	\$1,200	\$1,200	\$1,200	\$1,200	\$27,500	\$6,000	
Outdoor Recreation and Public Access																											
OR/PA-2	Develop materials to promote USCG Environmental Management	80	24	24	24	24		\$0	\$500	\$500	\$500	\$500								\$0	\$500	\$500	\$500	\$500	\$0	\$2,000	
	Provide access to space for community events and activities	8	8	8	8	8		\$0	\$100	\$100	\$100	\$100								\$0	\$100	\$100	\$100	\$100	\$0	\$400	
TOTAL		88	32	32	32	32	0	\$0	\$600	\$600	\$600	\$600	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$600	\$600	\$600	\$600	\$0	\$2,400	
Geographic Information Systems																											
GIS-1	Acquire a GIS									\$2,000										\$0	\$0	\$2,000	\$0	\$0	\$0	\$2,000	
	Develop GIS coverages		48												\$12,000					\$0	\$12,000	\$0	\$0	\$0	\$0	\$12,000	
GIS-2	Train as many installation personnel as possible in the use of this GIS			40	40	40										\$5,000	\$5,000	\$5,000		\$0	\$0	\$5,000	\$5,000	\$5,000	\$0	\$15,000	
TOTAL		0	48	40	40	40	0	\$0	\$0	\$2,000	\$0	\$0	\$0	\$0	\$12,000	\$5,000	\$5,000	\$5,000	\$0	\$0	\$12,000	\$7,000	\$5,000	\$5,000	\$0	\$29,000	
INRMP TOTALS		1528	1460	1356	1312	1292	484	\$3,600	\$4,450	\$5,750	\$4,200	\$43,600	\$0	\$1,200	\$13,200	\$46,200	\$6,200	\$6,200	\$67,500	\$4,800	\$17,650	\$51,950	\$10,400	\$49,800	\$67,500	\$134,600	

Table 5-2. INRMP Implementation Table (continued)

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6. ENVIRONMENTAL ASSESSMENT AND CONSEQUENCES

This section of the document assesses known, potential, and reasonably foreseeable environmental consequences related to implementing the INRMP and managing natural resources at TRACEN Cape May. Section 6.1 addresses implementation of the No Action Alternative that reflects the continuation of existing baseline conditions as described in Sections 3.0 through 5.0. Section 6.2 presents potential effects in the context of the scope of the Proposed Action and in consideration of the affected environment. This assessment presents resource areas adapted from the resources described in Sections 3.0, 4.0, and 5.0, as well as resource areas requiring assessment pursuant to DOT Order 5610.1C, *Procedures for Considering Environmental Impacts*, (i.e., socioeconomics and environmental justice). It also considers implementation of the selected management measures in their entirety (as presented in Sections 4.0 and 5.0). Cumulative effects are discussed in Section 6.3. Implementation of the INRMP (i.e., the Proposed Action) is USCG's preferred alternative. A summary of the potential environmental consequences associated with the No Action Alternative and the Proposed Action is also presented in Section 6.3.

Other management alternatives were considered during the screening process, but were eliminated because they were not economically feasible, ecologically sound, or compatible with the requirements of the mission. Section 4.0 provides a description of the goals and objectives used to develop management measures for each resource area's issues and concerns and the rationale for why certain management measures were selected. Therefore, the analytical framework supporting each resource area is not repeated in this section.

As discussed in Sections 1.4 and 4.1, the TRACEN Cape May INRMP is a "living" document that focuses on a 5-year planning period based on past and present actions. Short-term management practices included in the plan have been developed without compromising long-range goals and objectives. Because the plan will be modified over time, additional environmental analyses may be required as new management measures are developed for the long-term (i.e., beyond 5 years).

6.1 NO ACTION ALTERNATIVE

Adoption of the No Action Alternative would mean that TRACEN Cape May's INRMP would not be implemented and current natural resources management practices would continue "as is." Existing conditions and management practices would continue, and no new initiatives would be established.

Potential consequences associated with the No Action Alternative are discussed in this section for each resource area. Section 6.3 summarizes the analysis of potential consequences for the No Action Alternative and compares them to the Proposed Action. As shown, no significant or adverse effects would be expected. Under the No Action Alternative, the environmental conditions at TRACEN Cape May would not benefit from the management measures associated with implementing the proposed INRMP.

Expected consequences of the No Action Alternative for each resource area are presented in the following paragraphs:

- *Environmental Setting*—Minor adverse effects on the general environmental conditions of TRACEN Cape May would be expected under the No Action Alternative. Without a formal plan of action to manage the natural resources at TRACEN Cape May, certain resources would continue to be vulnerable to degradation.
- *Climate*—No effects on climate would be expected.
- *Air Quality*—No effects would be expected. The primary concern regarding air quality and potential environmental effects pertains to increases in pollutant emissions; exceedance of National Ambient Air Quality Standards (NAAQS) and other Federal, state, and local limits; and impacts on existing air permits. Potential effects on existing pollutant emissions are precluded by the fact that current natural resources management actions do not involve activities that would contribute to changes in existing air quality. Therefore, there would be no effects regarding air quality as under the No Action Alternative.
- *Noise*—No effects would be expected. The primary concern regarding noise and potential environmental effects pertains to increases in sound levels, exceedances of acceptable land use compatibility guidelines, and changes in public acceptance (i.e., noise complaints). Potential effects are precluded by the fact that current natural resources management actions do not involve activities that would affect noise conditions. Existing noise levels would not change. Therefore, there would be no effects regarding noise levels or sound quality under the No Action Alternative.
- *Topography*—Minor adverse effects would be expected. By failing to implement an effective soil erosion and sedimentation program, impacts on topography associated with erosion and sedimentation at TRACEN Cape May would be expected to continue.
- *Geology*—Minor adverse effects would be expected. By failing to implement an effective soil erosion and sedimentation program, impacts on geologic resources associated with erosion and sedimentation on TRACEN Cape May would be expected to continue.
- *Soils*—Minor adverse effects would be expected. By failing to implement an effective soil erosion and sedimentation program, impacts on soils associated with erosion and sedimentation on TRACEN Cape May would be expected to continue. The No Action Alternative does not include the implementation of soil conservation measures, or a plan of action to prevent or minimize potential soil problems related to erosion and sedimentation before their occurrence. The No Action Alternative would involve reactive management to problems after their occurrence, rather than on managing the resource to prevent impacts.
- *Water Resources*—Minor adverse effects would be expected to continue. The No Action Alternative does not provide a formal plan of action for monitoring and protecting the water resources at TRACEN Cape May. The water resources are vulnerable to degradation without the implementation of a formal plan of action that includes watershed protection measures, nonpoint source pollution controls, and a comprehensive monitoring program designed to identify water quality problems at their onset.
- *Wetlands*—No effects expected. Without implementation of the INRMP, TRACEN Cape May has a formal plan for evaluating and monitoring wetlands habitat

conditions and establishes formal protection measures to prevent or minimize potential impacts that could result from training and other mission-related activities.

- *Floodplain and Coastal Zones*—Minor adverse effects may occur. The No Action Alternative does not provide for the formal implementation of a routine floodplain or coastal zone monitoring program.
- *Aquatic Habitat*—Minor adverse effects would be expected to continue. The No Action Alternative does not provide for the formal implementation of a routine habitat assessment and monitoring program. Implementation of such a program not only provides a method for protecting these habitats, but also provides a baseline of data that can be used to prioritize stream restoration projects and identify the most efficient allocation of resources. In addition, the No Action Alternative does not establish routine management measures to protect and enhance these habitats by preventing or minimizing potential impacts.
- *Riparian Habitat*—No effects would be expected.
- *Terrestrial Ecosystems*—Minor adverse effects would be expected to continue. Under the No Action Alternative, there would be no formal plan of action to conserve terrestrial habitat conditions and diversity, resulting in a continued challenge for TRACEN Cape May to achieve their objective of providing benefits to wildlife species and to maintain or improve overall biodiversity.
- *Fauna*—Minor adverse effects would be expected to continue. Under the No Action Alternative, the health and condition of the wildlife populations would not be improved, and management measures to increase the abundance and biodiversity of wildlife at TRACEN Cape May would not be implemented. In addition, management measures designed to protect and enhance wildlife habitats (i.e., aquatic, riparian, wetlands, terrestrial) would not be implemented, thereby resulting in a continuing decline in the quality and complexity of the habitats. Decline in habitat quality and complexity would continue to adversely affect wildlife and biodiversity.
- *Endangered, Threatened, and Rare Species*—No effects would be expected for endangered, threatened, and rare species. The No Action Alternative provides special measures for the protection and management of these species or future nesting activity that may occur. Implementation of the No Action Alternative would continue the management of threatened and endangered species by TRACENCMINST 16450.
- *Land Use*—No effects would be expected. Under the No Action Alternative, no changes to on-site land uses or land use patterns would occur. Because land uses would not be expected to change on the TRACEN Cape May, land use patterns in the surrounding area would not be affected.
- *Facilities*—No effects would be expected. All facilities would continue to be maintained and operated in accordance with required permits and capabilities of the systems. The demand for utilities and roads would not be expected to change. Therefore, no effects to existing facilities would be expected under the No Action Alternative.
- *Hazardous and Toxic Materials*—No effects would be expected. Hazardous and toxic materials would continue to be handled in accordance with Federal laws and COMDTINST's, including the Resource Conservation and Recovery Act (RCRA), the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), and the Toxic

Substances Control Act (TSCA). Therefore, no adverse effects regarding the generation of hazardous and toxic materials would be expected under the No Action Alternative.

- *Socioeconomic Resources*—No effects would be expected. Under the No Action Alternative, typical changes in population, housing, and economic conditions would continue. Potential effects are precluded by the fact that the No Action Alternative does not involve activities that change existing socioeconomic resources.
- *Environmental Justice*—No effects would be expected. The primary concern regarding environmental justice and potential environmental effects pertains to disproportionately high and adverse consequences to minority or low-income communities. The No Action Alternative in itself does not create any advantage or disadvantage for any group or individual, and is not expected to create disproportionately high or adverse human health or environmental effects on minority or low-income populations or communities at or surrounding TRACEN Cape May. The Installation would address, however, any project-specific issues regarding disproportionate adverse health or environmental effects on minority or low-income groups, should they arise, and would use best environmental management practices to ensure compliance with applicable regulatory requirements. Therefore, there would be no effects as a result of implementation of the No Action Alternative.

In summary, the analysis of existing (i.e., baseline) conditions identifies no significant adverse environmental concerns, for the conservation, management, or restoration of its natural resources. This condition conflicts with TRACEN Cape May's underlying need to train personnel in a realistic natural setting while simultaneously meeting mission requirements and complying with environmental regulations and policies. In addition, the absence of a formal set of management measures inhibits the ability of the Installation to adequately engage in future planning initiatives, and does not capture benefits derived from identifying and executing comprehensive, integrated environmental and natural resources management strategies that might be implemented over the long-term. Therefore, implementation of the No Action Alternative is not the preferred alternative.

6.2 PROPOSED ACTION (PREFERRED ALTERNATIVE)

Potential consequences associated with the Proposed Action are discussed in this section for each resource area described in Section 6.0. Section 6.3 summarizes the analysis of potential consequences for the Proposed Action and compares them to the No Action Alternative (i.e., baseline or existing conditions). Potential environmental consequences associated with implementation of the INRMP would result in either no effects or beneficial effects for each resource area. Compared to the No Action Alternative, environmental conditions at TRACEN Cape May would improve as a result of implementing the proposed INRMP. Therefore, implementing the INRMP (i.e., the Proposed Action) is the preferred alternative.

The potential effects that would be expected as a result of implementation of the Proposed Action for each resource area are presented in the following paragraphs:

- *Environmental Setting* – Beneficial effects on the general environmental conditions of TRACEN Cape May would be expected from implementation of the Proposed Action. Implementation of the Proposed Action would have beneficial effects for

many of TRACEN Cape May's natural resources, which would result in overall improvement of the environmental setting.

- *Climate* – No effects on climate would be expected.
- *Air Quality* – No effects would be expected. The primary concern regarding air quality and potential environmental effects pertains to increases in pollutant emissions; exceedance of NAAQS and other Federal, state, and local limits; and impacts on existing air permits. Examples of activities that would result in potential adverse changes in air quality conditions include changes in equipment, increase in the number or location of personnel, construction of new facilities or modification of existing facilities, or increase or change in operations. However, potential effects on existing pollutant emissions are precluded by the fact that the Proposed Action does not involve activities that would contribute to changes in existing air quality conditions. Therefore, there would be no effects on air quality as a result of implementing the Proposed Action.
- *Noise* – No effects would be expected. The primary concern regarding noise and potential environmental effects pertains to increases in sound levels, exceedances of acceptable land use compatibility guidelines, and changes in public acceptance (i.e., noise complaints). However, potential effects are precluded by the fact that the Proposed Action does not involve activities that would impact noise conditions, such as changes in equipment; increase in the number or location of personnel; construction of new facilities or modification of existing facilities; or increase or change in operations. Therefore, there would be no effects on noise levels or sound quality as a result of implementing the Proposed Action.
- *Topography* – Beneficial effects would be expected. By implementing an effective soil erosion and sedimentation program, impacts on topography associated with erosion and sedimentation at TRACEN Cape May would be minimized.
- *Geology* – Beneficial effects would be expected. By implementing an effective soil erosion and sedimentation program, impacts on geologic resources associated with erosion and sedimentation on TRACEN Cape May would be minimized.
- *Soils* – Beneficial effects would be expected. By implementing an effective soil erosion and sedimentation program, impacts on soils associated with erosion and sedimentation on TRACEN Cape May would be minimized. As part of the Proposed Action, existing sites where erosion has been determined to be a problem would be addressed. In addition, monitoring of soil conditions on the Installation to identify potential problem areas, the implementation of conservation measures in areas where exposure of soils is necessary and, when possible, the avoidance of activities likely to result in erosion would minimize potential impacts on the soil resources and result in a reduction in erosion at TRACEN Cape May.
- *Water Resources* – Beneficial effects would be expected. Efforts to limit impacts on water bodies would reduce the potential for water quality degradation both in and adjacent to TRACEN Cape May. Proper application of turf management chemicals, fungicides, and insecticides would minimize the potential impacts on water bodies associated with the use of these chemicals at TRACEN Cape May.
- *Wetlands* – Beneficial effects would be expected. Implementation of the Proposed Action would protect wetlands by providing a basis to evaluate and monitor habitat conditions through the continuing development of the wetlands database for TRACEN Cape May. The establishment of buffers would minimize potential

impacts to wetlands associated with adjacent activities. Additional efforts would be made to reduce impacts to wetlands by planning mission activities, when possible, in a manner consistent with wetlands protection objectives. Where current activities may be impacting wetlands functions, efforts would be made to identify the type and source of impacts and, where applicable, restoration of affected habitats would be implemented.

- *Floodplains and Coastal Zones* – Beneficial effects would be expected. Implementation of the Proposed Action would protect floodplains and coastal zones by providing a basis to evaluate and monitor habitat conditions through the development of a floodplain/coastal zone monitoring program and database.
- *Aquatic Habitat* – Beneficial effects would be expected. The assessment of aquatic habitats at TRACEN Cape May would provide a basis to develop a management program that would both protect and enhance these habitats on the Installation. Assessment of aquatic habitats at TRACEN Cape May also would provide a baseline that can be used in tracking conditions and trends of these habitats, which would allow management practices to be applied where and when needed. The establishment of limited-use buffers around water bodies would provide protection to habitats both in and adjacent to the resource. Where impacts on aquatic habitats occur as a result of mission activities, management objectives provide for the timely mitigation of the impacts.
- *Riparian Habitat* – No effects would be expected.
- *Terrestrial Ecosystems* – Beneficial effects would be expected. From the perspective of habitat, implementation of the Proposed Action would result in improved terrestrial habitat conditions for wildlife because maintaining a high level of habitat diversity in areas of the TRACEN Cape May that do not conflict with the mission is a priority of the INRMP.
- *Fauna* – Beneficial effects on game and nongame species would be expected. Implementation of the Proposed Action would result in several open grassland prairie conservation areas, as well as improved habitat for nongame species.
- *Endangered, Threatened, and Rare Species* – Beneficial effects on all special status species at TRACEN Cape May would be expected. Implementation of the Proposed Action would provide protection and management for species not protected under the ESA, as well as for species, which are federally- or state-listed but not known to nest or den on the Installation. Also, under the Proposed Action, rare flora and fauna would be treated with added importance and valued for their contribution to the unique natural heritage of TRACEN Cape May. Based on the restrictive and the proactive management actions presented in this INRMP, the piping plover, least tern, or seabeach amaranth will not likely be adversely affected by the Proposed Action.
- *Land Use* – Beneficial impacts would be expected. Under the Proposed Action, greater guidance on the overall land use management objective would be afforded. Land uses would not be specifically expected to change on the Installation, but instead land use patterns would be enhanced through the conversion of improved grounds to semi-improved grounds, and semi-improved grounds to unimproved grounds.
- *Facilities* – No effects would be expected. Facilities would continue to be maintained and operated in accordance with required permits and capabilities of the

systems. Under the Proposed Action, the demand for utilities and roads would not be expected to increase and, therefore, would not adversely affect existing facilities.

- *Hazardous and Toxic Materials* – No effects would be expected. Hazardous and toxic materials would continue to be handled in accordance with Federal laws and COMDTINST's, including the Resource Conservation and Recovery Act (RCRA), the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), and the Toxic Substances Control Act (TSCA). Therefore, no adverse effects regarding the generation of hazardous and toxic materials would be expected under the Proposed Action.
- *Socioeconomic Resources* – No effects would be expected. The primary concern regarding potential effects on socioeconomic resources pertains to changes in population, housing, and economic conditions. Potential effects are precluded by the fact that the Proposed Action does not involve any activities that would contribute to changes in socioeconomic resources. Therefore, there would be no effects on socioeconomic resources as a result of implementing the Proposed Action.
- *Environmental Justice* – No effects would be expected. The primary concern regarding environmental justice and potential environmental effects pertains to disproportionately high and adverse consequences to minority or low-income communities. Implementation of the Proposed Action in itself would not create any advantage or disadvantage for any group or individual. The proposed INRMP is not expected to create disproportionately high or adverse human health or environmental effects on minority or low-income populations or communities at or surrounding TRACEN Cape May. The Installation would address, however, any project-specific issues regarding disproportionate adverse health or environmental effects on minority or low-income groups, should they arise, and would use best environmental management practices to ensure compliance with applicable regulatory requirements. Therefore, there would be no effects as a result of implementing the Proposed Action.

These findings are consistent with the goals of the natural resources management program to maintain ecosystem viability and ensure the sustainability of desired training conditions; to maintain, protect and improve ecological integrity; to protect and enhance biological communities, particularly sensitive, rare, threatened, and endangered species; to protect the ecosystems and their components from damage or degradation; and to identify and restore degraded habitats. The nature of the management measures recommended by the INRMP, if implemented, would directly and positively affect the health and condition of natural resources at TRACEN Cape May.

6.3 CUMULATIVE EFFECTS

A cumulative effect is defined as an effect on the environment that results from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place locally or regionally over a period of time.

Implementation of the INRMP would result in a comprehensive natural resource management strategy for TRACEN Cape May that represents compliance, restoration, prevention, and conservation; improves the existing management approach for natural resources on the TRACEN Cape May; and meets legal and policy requirements consistent with national natural resources

management philosophies. Implementation would be expected initially to improve existing environmental conditions at TRACEN Cape May, as shown by the potential for beneficial effects in Table 6-1 and as described in Section 6.2. Over time, adoption of the Proposed Action would enable TRACEN Cape May to achieve their goal of maintaining ecosystem viability and ensuring sustainability of desired training conditions.

Table 6-1. Summary of Potential Environmental Consequences

Resource Area/Environmental Condition ¹	Environmental Consequence	
	No Action Alternative	Proposed Action
Environmental Setting	Minor Adverse	Beneficial
Climate	None	None
Air Quality	None	None
Noise	None	None
Topography	Minor Adverse	Beneficial
Geology	Minor Adverse	Beneficial
Soils	Minor Adverse	Beneficial
Water Resources	Minor Adverse	Beneficial
Wetlands and Floodplains	None	Beneficial
Aquatic Habitat	Minor Adverse	Beneficial
Riparian Habitat	None	None
Terrestrial Ecosystems	Minor Adverse	Beneficial
Fauna	Minor Adverse	Beneficial
Endangered, Threatened, and Rare Species	None	Beneficial
Land Use	None	Beneficial
Facilities	None	None
Hazardous and Toxic Materials	None	None
Socioeconomic Resources	None	None
Environmental Justice	None	None

¹ Resource areas presented in this column are adapted from the resources described in Sections 3.0, 4.0, and 5.0, as well as those resource areas requiring assessment pursuant to DOT Order 5610.1C, *Procedures for Considering Environmental Impacts*.

7. LIST OF PREPARERS

This INRMP was prepared by engineering-environmental Management, Inc. (e²M) under the direction of the Environmental Planning Division of the USCG and TRACEN Cape May, and in cooperation with the TRACEN Cape May INRMP Focus Group. The individuals who contributed to the preparation of this document are listed below.

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APPENDIX A

**ACRONYMS,
TERMS, AND DEFINITIONS**

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ACRONYMS

µg/m ³	micrograms per cubic meter	FICUN	Federal Interagency
ANGR	Army National Guard Range		Committee on Urban Noise
ANSI	American National Standards Institute	FICWD	Federal Interagency Committee for Wetland Delineation
ANG	Aids to Navigation		
AST	Above Ground Storage Tank	FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
BMPs	Best Management Practices		
BOD	Biological Oxygen Demand	FIRM	Flood Insurance Rate Map
CAA	Clean Air Act	FL	Sandy Fill (Soil Type)
CAD	Computer-Aided Drafting	FM	Sandy Fill/Organic Substratum (Soil Type)
CD	Compact Disk		
CEQ	Council on Environmental Quality	FONPA	Finding of No Practicable Alternative
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	FONSI	Finding of No Significant Impact
		FR	Federal Register
CFR	Code of Federal Regulations	FRP	Facility Response Plan
cm	Centimeter	ft ²	square feet
CMZ	Coastal Management Zone	FUDS	Formerly Used Defense Sites
CO	Carbon Monoxide	FWM	Fish and Wildlife Management
CO ₂	Carbon Dioxide	FWS	U.S. Fish and Wildlife Service
COMDTINST	Commandant Instruction	FY	Fiscal Year
COMDTPUB	Commandant Publication	GIS	Geographical Information System
CU	Coastal Beach Urban Land Complex (Soil Type)	G-LEL	Commandant Office of Environmental Law
CWA	Clean Water Act		
DMS	Dimethyl Sulphide	G-M	Commandant, Marine Safety and Environmental Protection
DOT	Department of Transportation		
E&S	Erosion and Sedimentation	G-SEC	Commandant, Office of Civil Engineering
EA	Environmental Assessment		
ECE	Environmental Compliance Evaluation	HQ	headquarters
		HUD	U.S. Department of Housing and Urban Development
EE	Ecological Economics		
EIAP	Environmental Impact Analysis Process	IGCE	Independent Government Cost Estimate
EIS	Environmental Impact Statement	INRMP	Integrated Natural Resources Management Plan
EO	Executive Order	IRP	Installation Restoration Program
EOW	Engineer on Watch		
EPA	U.S. Environmental Protection Agency	LMU	Land Use Management Unit
		MA	Massachusetts
EPC	Environmental Protection Committee	m	meters
		mg/m ³	milligrams per cubic meter
ESA	Endangered Species Act	MLC LANT	USCG Maintenance and Logistics Command Atlantic
FEMA	Federal Emergency Management Agency	MOA	Memorandum of Agreement
		MOU	Memorandum of Understanding
FICON	Federal Interagency Committee on Noise	MWR	Morale Welfare and Recreation

N.J.A.C.	New Jersey Administrative Code	Pb	lead
NJSA	New Jersey Statutes and Acts	PM ₁₀	Particulate Matter Less Than 10 Microns in Size
NAAQS	National Ambient Air Quality Standards	PM _{2.5}	particulate matter equal to or less than 2.5 microns in diameter
NAS	National Airspace System		
NEPA	National Environmental Policy Act	ppm	parts per million
NHRP	National Registry of Historic Places	RCRA	Resource Conservation and Recovery Act
NJ	New Jersey	ROD	Record of Decision
NJAPCA	New Jersey Air Pollution Control Act	SCS	Soil Conservation Service
NJDEP	New Jersey Department of Environmental Protection	SEAL	Sea-Air-Land
NJNHP	New Jersey Natural Heritage Program	SEL	Sound Exposure Level
NMFS	National Marine Fisheries Service	SGQCL	Specific Groundwater Quality Criteria Level
NO ₂	nitrogen dioxide	SIP	State Implementation Plan
NOI	Notice of Intent	SO ₂	Sulfur Dioxide
NPDES	National Pollutant Discharge Elimination System	SOW	Statement of Work
NPS	Non-point Source	SPCC	Spill Prevention Control and Countermeasures
NRCS	Natural Resources Conservation Service	TE	Threatened or Endangered Species and Critical Habitats
NWI	National Wetlands Inventory	TSP	Total Suspended Particulates
NWR	National Wildlife Refuge	U.S.	United States
O ₂	Oxygen	U.S.C.	United States Code
O ₃	Ozone	USACOE	U.S. Army Corps of Engineers
°F	degrees Fahrenheit	USCG	U.S. Coast Guard
OR/PA	Outdoor Recreation and Public Access	USDA	U.S. Department of Agriculture
PA	Public Affairs	USGS	U.S. Geological Survey
		WMA	Wildlife Management Area
		WT	Wetlands and Floodplains

TERMS AND DEFINITIONS

Biological Diversity – The variety of life forms, the ecological roles they perform, and the genetic variability they contain within any defined time and space.

Cooperative Agreement – A written agreement between an USCG and one or more outside agencies (Federal, state, or local) that coordinates planning strategies. It is a vehicle for obtaining assistance in developing natural resources programs.

Critical Habitat – Any air, land, or water area (excluding existing synthetic structures or settlements that are not necessary to the survival and recovery of a listed species) and constituents thereof that the U.S. Fish and Wildlife Service has designated as essential to the survival and recovery of an endangered or threatened species or a distinct segment of its population.

Ecosystem Management – An approach to natural resources management that focuses on the interrelationships of ecological processes linking soils, plants, animals, minerals, climate, water, and topography. Managers view such processes as a living system that affects and responds to human activity beyond traditional commodity and amenity uses. They also acknowledge the importance of ecosystem services such as water conservation, oxygen recharge, and nutrient recycling.

Endangered Species – Any plant or animal listed or proposed for listing as threatened or endangered by the Federal Government or state Governments.

Exotic Species – Any plant or animal not native to a region, state, or country. (This definition excludes certain game species that have become established, such as pheasants.)

Featured Species – A fish or wildlife species whose habitat requires fish or wildlife management (including coordination, multiple-use planning, direct habitat improvements, and cooperative programs) on a unit of land or water. Also refers to a tree species that the forest management plan cites as having value for wood fiber production. The plan usually specifies one or more featured tree species along with one or more associated species to meet multiple-use management objectives.

Fish – Fresh and salt water fin-fish, other aquatic vertebrate organisms, and crustaceans and mollusks.

Floodplains – Lowland or flat areas adjoining inland and coastal waters, including flood-prone areas on offshore islands, that have a 1 percent or greater chance of flooding in any given year.

Game – Any species of fish or wildlife for which state or Federal laws and regulations prescribe seasons and bag or creel limits.

Habitat – An area that provides the environmental elements of air, water, food, cover, and space necessary for a given species to survive and reproduce.

Highly Erodible Soils – Soils that, because of their physical properties or slope, the U.S. Department of Agriculture, Soil Conservation Service, identifies as being highly susceptible to wind or water erosion.

Improved Grounds – Grounds on which personnel annually plan and perform intensive maintenance activities. These are developed areas of an area that have lawns and landscape plantings that require intensive maintenance. They usually include the parade ground, drill fields, athletic areas, and housing areas.

Integrated Natural Resources Management Plan – A natural resources management plan based on ecosystem management that shows the interrelationships of the individual component plans as well as mission and land use activities affecting the basic land management plans.

Land Management Unit – The smallest land management division that planners use in developing specific strategies to accomplish natural resources management goals. Land management units may correspond to grazing units on agricultural outleased land, stands or compartments on commercial forest lands, various types of improved grounds (for example, athletic fields, parks, yards in family housing, or landscaped areas around administrative buildings), or identifiable semi-improved grounds (for example, airfield areas, utility rights-of-way, or roadside areas).

Land-Use Regulation – A document that prescribes the specific technical actions or land use and restrictions with which lessees, permittees, or contractors must comply. It derives from the grazing or cropland management plan and forms a part of all outleases, land use permits, and other contracts.

Multiple-Use – The integrated, coordinated, and compatible use of various natural resources to derive the best benefit while perpetuating and protecting those resources.

Multiple-Use and Sustained Yield Management – The care and use of natural resources so as to best serve the present and future needs of the United States and its people without impairing the productivity of the land and water.

Natural Resources Management Professional – A person with a degree in the natural sciences who manages natural resources on a regular basis and receives periodic training to maintain proficiency in that job.

NO FUNDS Service Contract – An agreement by which a party performs a land management service for a consideration other than funds. Such a contract exists, for example, when a party hired to establish, control, or remove vegetative cover or growth agrees to take payment for the service in the form of the growth that results.

Outdoor Interpretation – Observing and explaining the history, development, and significance of our natural heritage and natural resources.

Outdoor Recreation – Recreation that relates directly to and occurs in natural, outdoor environments.

Outdoor Recreation Resources – Land and water areas and associated natural resources that provide, or have the potential to provide, opportunities for outdoor recreation for current and future generations.

Procurement Contract – An agreement by which the Government agrees to pay a contractor to establish, control, or remove vegetative cover or growth for land management purposes. This contract may not extend beyond the period for which funding for the service is available.

Recreation Carrying Capacity – The level of recreational use that an area can sustain without damage to the environment.

Semi-Improved Grounds – Grounds where personnel perform periodic maintenance primarily for operational and aesthetic reasons (such as erosion and dust control, bird control, and visual clear zones).

Stewardship – The management of resources with the goal of maintaining or increasing the resource's value indefinitely into the future.

Threatened Species – Those federally or state-listed species of flora and fauna that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range and that have been designated for special protection and management pursuant to the Endangered Species Act.

Unimproved Grounds – Grounds not classified as improved or semi-improved and usually not mowed more than once a year. These include beaches; forest lands; ponds, and wetlands.

Urban Forests – Planted or remnant native tree species existing within urbanized areas such as parks, tree-lined residential streets, scattered tracts of undisturbed woodlands, and cantonment areas.

Urban Wildlife – Wildlife that habitually live or periodically survive in an urban environment on improved or semi-improved grounds.

Watchable Wildlife Areas – Areas identified under the Watchable Wildlife Program as suitable for passive recreational uses such as bird watching, nature study, and other nonconsumptive uses of wildlife resources.

Wetlands – Areas inundated or saturated by surface or groundwater at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Wildlife-Carrying Capacity – The maximum density of wildlife that a particular area or habitat can carry on a sustained basis without deterioration of the habitat.

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APPENDIX B

TRACEN CAPE MAY INRMP FOCUS GROUP DOCUMENTATION AND CORRESPONDENCE

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August 19, 2002

Mr. Carlo Popolizio
USFWS
New Jersey Ecological Services Field Office
927 N. Main Street, Building D
Pleasantville, New Jersey 08232

Reference: Seabeach Amaranth (*Amaranthus pumilus*) Survey

Dear Mr. Popolizio,

While Seabeach Amaranth (*Amaranthus pumilus*) has not been documented on the Installation, USFWS has indicated that the species is expanding its range into new areas, which possibly includes U.S. Coast Guard (USCG) Training Center (TRACEN) Cape May. Based on this communication from Mr. John Staples (USFWS – New Jersey Ecological Services Field Office) dated 26 February 2002, a survey has been conducted in conjunction with the preparation of the U.S. Coast Guard (USCG) Integrated Natural Resources Management Plan (INRMP) and Environmental Assessment (EA) for the USCG TRACEN Cape May.

The INRMP and EA are being developed for USCG TRACEN Cape May in accordance with the National Environmental Policy Act (NEPA), COMDINST 5090.3 – *Natural Resources Management*, COMDPUB 5090.1 – *Commanding Officer's Environmental Guide*, COMDINST M16475.1B – *NEPA Implementing Procedures and Policy for Considering Environmental Impacts*. In addition, although the USCG TRACEN Cape May is a Department of Transportation facility, the tenets established for Department of Defense installations under the Sikes Act (16 United States Code [U.S.C.] 670a et seq.) will be adhered to where applicable. The preparation of an INRMP may be considered a major Federal action. Therefore, this INRMP also includes an EA for the implementation of this plan at USCG TRACEN Cape May. In addition, in accordance with §670a(2) of the Sikes Act, concurrence on the INRMP with the U.S. Fish and Wildlife Service (Service) and the New Jersey Department of Environmental Protection – Department of Fish and Wildlife (NJDFW) the INRMP will be requested.

BACKGROUND:

Seabeach amaranth has been documented in Monmouth County and Upper Township, Cape May County, New Jersey. Seabeach amaranth is an annual plant endemic to the Atlantic Coast beaches and barrier islands. The primary habitat of seabeach amaranth consists of overwash flats at accreting ends of islands, lower fore dunes, and upper strands of non-eroding beaches (landward of the wrackline), although the species occasionally establishes small temporary populations in other habitats, including sound-side beaches, blowouts in fore dunes, inter-dunal areas, and on sand and shell material deposited for beach replenishment or as dredge spoil. Seabeach amaranth usually is found growing on a nearly pure sand substrate, occasionally with shell fragments mixed in.

Seabeach amaranth occupies elevations from eight inches to five feet above mean high tide and is intolerant of even occasional flooding during its growing season of early June into late fall. The habitat of seabeach amaranth is sparsely vegetated with annual herbs and, less commonly, perennial herbs (mostly grasses), and scattered shrubs. Vegetative associates of seabeach amaranth include sea rocket (*Cakile edentula*), seabeach spurge (*Chamaesyce polygonifolia*), and other species of open, sandy beach habitats. Seabeach amaranth is often associated with beaches managed for the protection of beach nesting birds such as the piping plover and least tern. Threats to seabeach amaranth include beach stabilization efforts (particularly the use of beach armoring, such as sea walls and riprap), intensive recreational use, and herbivory by webworms. Seabeach amaranth is sensitive to trampling and crushing by pedestrian or vehicular traffic.

SURVEY RESULTS:

A seabeach amaranth survey was conducted on 7 August 2002 to determine if the species is located on the Installation. Mr. Gino Giumarro (engineering-environmental Management [e²M]), Mr. Brian Hoppy (e²M), Mr. Chris Hajduk (TRACEN Cape May), and Petty Officer Rockledge (TRACEN Cape May) performed the survey between 900 hrs and 1500 hrs. Line transects were utilized along the high tide line with individuals spaced four feet into the overwash area. Individuals performed this pedestrian survey walking parallel to other survey members, while stopping every five feet to examine for occurrence of the plant. The survey began on the east section of the beach and concluded at the southern property boundary. Upon reaching the western property boundary, the survey team performed a 'walk' of the same area to ensure proper coverage. Species observed during the survey included: beach grass (*Ammophila breviligulata*), Bermuda grass (*Cynodon dactylon*), cocklebur (*Xanthium spinosum*), saltwort (*Batis maritima*), searocket, seaside goldenrod (*Solidago sempervirens*), and seaside spurge. **No occurrence** of seabeach amaranth was observed during the survey.

USCG TRACEN Cape May will continue to perform additional surveys for the presence of the plant prior to all land disturbing activities, such as beach replenishment. The USFWS New Jersey Ecological Services Field Office will be copied on the results of future surveys.

Enclosed, please find a map depicting the location of the USCG TRACEN Cape May noting the area surveyed. e²M will also be contacting your office in the near future to request your participation in collaborative INRMP Focus Group designed to ensure that the management goals, objectives, and actions of the INRMP reflect the goals of your organization. Should you have any questions concerning the survey, please contact me at (434) 244-6497 or Brian Hoppy of our Philadelphia office at (610) 649-8064. Thank you.

Sincerely,

engineering-environmental Management, Inc.



Gino J.M. Giumarro, Wildlife Biologist / Project Manager

Enclosures: TRACEN Cape May Seabeach Amaranth Survey Map

cc: Christopher Hajduk, USCG TRACEN
e²M Project File 4158-001

B. Hoppy, e²M



January 16, 2002

Mr. Andy Didun
N.J. Division of Fish and Wildlife
P.O. Box 400
501 E. State St., 3rd Floor
Trenton, NJ 08625-0400

Reference: U.S. Coast Guard Training Center Cape May Integrated Natural Resources Management Plan and Environmental Assessment, New Jersey

Dear Mr. Didun,

The U.S. Coast Guard (USCG) is preparing an Integrated Natural Resources Management Plan (INRMP) and Environmental Assessment (EA) for the USCG Training Center (TRACEN) Cape May. The INRMP and EA are being developed for USCG TRACEN Cape May in accordance with the National Environmental Policy Act (NEPA), COMDINST 5090.3 – *Natural Resources Management*, COMDPUB 5090.1 – *Commanding Officer's Environmental Guide*, COMDINST M16475.1B – *NEPA Implementing Procedures and Policy for Considering Environmental Impacts*. In addition, although the USCG TRACEN Cape May is a Department of Transportation facility, the tenets established for Department of Defense installations under the Sikes Act (16 United States Code [U.S.C.] 670a et seq.) will be adhered to where applicable. The preparation of an INRMP may be considered a major Federal action. Therefore, this INRMP also includes an EA for the implementation of this plan at USCG TRACEN Cape May. In addition, in accordance with §670a(2) of the Sikes Act, concurrence on the INRMP with the U.S. Fish and Wildlife Service (Service) and the New Jersey Department of Environmental Protection – Department of Fish and Wildlife (NJDFW) the INRMP will be requested.

The INRMP will provide USCG TRACEN Cape May with a description of the installation and its surrounding environments, and will present various management practices designed to mitigate negative impacts and enhance the positive effects of the installation's mission on regional ecosystems. Natural resources management will be balanced against the requirements of USCG TRACEN Cape May to accomplish its mission at the highest possible level of efficiency. To obtain an accurate assessment of USCG TRACEN Cape May's influence, analyses will be conducted to determine the physical and biotic nature of USCG TRACEN Cape May and its surrounding environment, as well as the operational activities taking place.

In accordance with the Executive Order 12372, Intergovernmental Review, and in conjunction with the Sikes Act we request your assistance in the development of the INRMP and EA. Pursuant to the Endangered and Nongame Species Conservation Act (New Jersey Permanent Statutes 23:2A-1 to 13), and the Endangered Plant Species List Act (New Jersey Permanent Statutes 13:1B-15.151 to 15.158), we are requesting a current listing of state-listed threatened, endangered, or otherwise sensitive species known to occur within or in proximity to USCG TRACEN Cape May.

Enclosed, please find a map depicting the location of the USCG TRACEN Cape May. Please note, that similar correspondence has been forwarded to Mr. Clifford Day (USFWS New Jersey

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DENVER TULSA JACKSONVILLE SAN DIEGO SACRAMENTO SAN ANTONIO FAIRFAX

Page 2 of 2 – January 16, 2002

Ecological Services Field Office), and to Mr. Tom Breden (New Jersey Natural Heritage Program).

Written responses should be sent to e²M the attention of Mr. Gino Giumarro, Project Manager, at the following address:

Gino Giumarro
e²M
1109 E. Jefferson Street
Charlottesville, VA 22902

Please provide the above-requested information at your earliest convenience but no later than February 18, 2002. You may also fax the requested information to Gino Giumarro at 434-244-4970.

e²M will also be contacting your office in the near future to request your participation in collaborative INRMP Task Force designed to ensure that the management goals, objectives, and actions of the INRMP reflect the goals of your organization. Should you have any questions concerning the INRMP or EA, please contact me at (434) 245-1631 or Brian Hoppy of our Philadelphia office at (610) 649-8064. Thank you.

Sincerely,

engineering-environmental Management, Inc.



Gino J.M. Giumarro, Wildlife Biologist / Project Manager
Conservation & Planning

Enclosures: Figure 1, Location Map of USCG TRACEN Cape May

cc: Christopher Hajduk, USCG TRACEN
e²M Project File 4158-001

B. Hoppy, e²M



Figure 1. USCG Cape May TRACEN Location



January 16, 2002

Mr. Tom Breden
The New Jersey Natural Heritage Program
Office of Natural Lands Management
Division of Parks and Forestry
Department of Environmental Protection
P.O. Box 404, Trenton, New Jersey 08625

Reference: U.S. Coast Guard Training Center Cape May Integrated Natural Resources Management Plan and Environmental Assessment, New Jersey

Dear Mr. Breden,

The U.S. Coast Guard (USCG) is preparing an Integrated Natural Resources Management Plan (INRMP) and Environmental Assessment (EA) for the USCG Training Center (TRACEN) Cape May. The INRMP and EA are being developed for USCG TRACEN Cape May in accordance with the National Environmental Policy Act (NEPA), COMDINST 5090.3 – *Natural Resources Management*, COMDPUB 5090.1 – *Commanding Officer's Environmental Guide*, COMDINST M16475.1B – *NEPA Implementing Procedures and Policy for Considering Environmental Impacts*. In addition, although the USCG TRACEN Cape May is a Department of Transportation facility, the tenets established for Department of Defense installations under the Sikes Act (16 United States Code [U.S.C.] 670a et seq.) will be adhered to where applicable. The preparation of an INRMP may be considered a major Federal action. Therefore, this INRMP also includes an EA for the implementation of this plan at USCG TRACEN Cape May. In addition, in accordance with §670a(2) of the Sikes Act, concurrence on the INRMP with the U.S. Fish and Wildlife Service (Service) and the New Jersey Department of Environmental Protection – Department of Fish and Wildlife (NJDFW) the INRMP will be requested.

The INRMP will provide USCG TRACEN Cape May with a description of the installation and its surrounding environments, and will present various management practices designed to mitigate negative impacts and enhance the positive effects of the installation's mission on regional ecosystems. Natural resources management will be balanced against the requirements of USCG TRACEN Cape May to accomplish its mission at the highest possible level of efficiency. To obtain an accurate assessment of USCG TRACEN Cape May's influence, analyses will be conducted to determine the physical and biotic nature of USCG TRACEN Cape May and its surrounding environment, as well as the operational activities taking place.

In accordance with the Executive Order 12372, Intergovernmental Review, and in conjunction with the Sikes Act we request your assistance in the development of the INRMP and EA. Pursuant to the Endangered and Nongame Species Conservation Act (New Jersey Permanent Statutes 23:2A-1 to 13), and the Endangered Plant Species List Act (New Jersey Permanent Statutes 13:1B-15.151 to 15.158), we are requesting a current listing of state-listed threatened, endangered, or otherwise sensitive species known to occur within or in proximity to USCG TRACEN Cape May.

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DENVER TULSA JACKSONVILLE SAN DIEGO SACRAMENTO SAN ANTONIO FAIRFAX

Page 2 of 2 – January 16, 2002

Enclosed, please find a map depicting the location of the USCG TRACEN Cape May. Please note, that similar correspondence has been forwarded to Mr. Clifford Day (USFWS New Jersey Ecological Services Field Office), and to Mr. Andy Didun (New Jersey Department of Fish and Wildlife).

Written responses should be sent to e²M the attention of Mr. Gino Giumarro, Project Manager, at the following address:

Gino Giumarro
e²M
1109 E. Jefferson Street
Charlottesville, VA 22902

Please provide the above-requested information at your earliest convenience but no later than February 18, 2002. You may also fax the requested information to Gino Giumarro at 434-244-4970.

e²M will also be contacting your office in the near future to request your participation in collaborative INRMP Task Force designed to ensure that the management goals, objectives, and actions of the INRMP reflect the goals of your organization. Should you have any questions concerning the INRMP or EA, please contact me at (434) 245-1631 or Brian Hoppy of our Philadelphia office at (610) 649-8064. Thank you.

Sincerely,

engineering-environmental Management, Inc.



Gino J.M. Giumarro, Wildlife Biologist / Project Manager
Conservation & Planning

Enclosures: Figure 1, Location Map of USCG TRACEN Cape May

cc: Christopher Hajduk, USCG TRACEN
e²M Project File 4158-001

B. Hoppy, e²M



Figure 1. USCG Cape May TRACEN Location



January 16, 2002

Mr. Clifford Day
USFWS
New Jersey Ecological Services Field Office
927 N. Main Street, Building D
Pleasantville, New Jersey 08232

Reference: U.S. Coast Guard Training Center Cape May Integrated Natural Resources Management Plan and Environmental Assessment, New Jersey

Dear Mr. Breden,

The U.S. Coast Guard (USCG) is preparing an Integrated Natural Resources Management Plan (INRMP) and Environmental Assessment (EA) for the USCG Training Center (TRACEN) Cape May. The INRMP and EA are being developed for USCG TRACEN Cape May in accordance with the National Environmental Policy Act (NEPA), COMDINST 5090.3 – *Natural Resources Management*, COMDPUB 5090.1 – *Commanding Officer's Environmental Guide*, COMDINST M16475.1B – *NEPA Implementing Procedures and Policy for Considering Environmental Impacts*. In addition, although the USCG TRACEN Cape May is a Department of Transportation facility, the tenets established for Department of Defense installations under the Sikes Act (16 United States Code [U.S.C.] 670a et seq.) will be adhered to where applicable. The preparation of an INRMP may be considered a major Federal action. Therefore, this INRMP also includes an EA for the implementation of this plan at USCG TRACEN Cape May. In addition, in accordance with §670a(2) of the Sikes Act, concurrence on the INRMP with the U.S. Fish and Wildlife Service (Service) and the New Jersey Department of Environmental Protection – Department of Fish and Wildlife (NJDFW) the INRMP will be requested.

The INRMP will provide USCG TRACEN Cape May with a description of the installation and its surrounding environments, and will present various management practices designed to mitigate negative impacts and enhance the positive effects of the installation's mission on regional ecosystems. Natural resources management will be balanced against the requirements of USCG TRACEN Cape May to accomplish its mission at the highest possible level of efficiency. To obtain an accurate assessment of USCG TRACEN Cape May's influence, analyses will be conducted to determine the physical and biotic nature of USCG TRACEN Cape May and its surrounding environment, as well as the operational activities taking place.

In accordance with the Executive Order 12372, Intergovernmental Review, and in conjunction with the Sikes Act we request your assistance in the development of the INRMP and EA. Pursuant to the requirements of Section 7(c) of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1536), we are requesting a current listing of Federally-listed threatened, endangered, or otherwise sensitive species known to occur within or in proximity to USCG TRACEN Cape May.

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DENVER TULSA JACKSONVILLE SAN DIEGO SACRAMENTO SAN ANTONIO FAIRFAX

Page 2 of 2 – January 16, 2002

Enclosed, please find a map depicting the location of the USCG TRACEN Cape May. Please note, that similar correspondence has been forwarded to Mr. Tom Breden (New Jersey Natural Heritage Program), and to Mr. Andy Didun (New Jersey Department of Fish and Wildlife).

Written responses should be sent to e²M the attention of Mr. Gino Giumarro, Project Manager, at the following address:

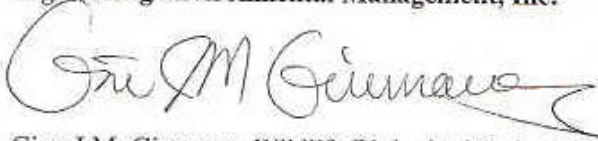
Gino Giumarro
e²M
1109 E. Jefferson Street
Charlottesville, VA 22902

Please provide the above-requested information at your earliest convenience but no later than February 18, 2002. You may also fax the requested information to Gino Giumarro at 434-244-4970.

e²M will also be contacting your office in the near future to request your participation in collaborative INRMP Task Force designed to ensure that the management goals, objectives, and actions of the INRMP reflect the goals of your organization. Should you have any questions concerning the INRMP or EA, please contact me at (434) 245-1631 or Brian Hoppy of our Philadelphia office at (610) 649-8064. Thank you.

Sincerely,

engineering-environmental Management, Inc.



Gino J.M. Giumarro, Wildlife Biologist / Project Manager
Conservation & Planning

Enclosures: Figure 1, Location Map of USCG TRACEN Cape May

cc: Christopher Hajduk, USCG TRACEN
e²M Project File 4158-001

B. Hoppy, e²M





State of New Jersey

Department of Environmental Protection
Division of Fish and Wildlife

P.O. Box 400

Trenton, NJ 08625-0400

Robert McDowell, Director

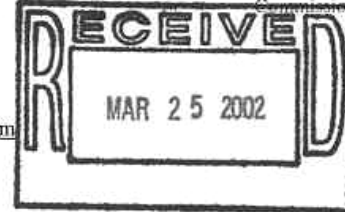
(609) 292-9410, fax (609) 984-1414

Visit our Division Website: www.njfishandwildlife.com

March 20, 2002

James E. McGreevey
Governor

Bradley M. Campbell
Commissioner



Gino J.M. Giumarro
Engineering-Environmental Mangement Inc.
10331 Democracy Lane
Fairfax, VA 22030

Dear Mr. Giumarro:

I am responding to your letter of January 16, 2002 to Mr. Andy Didun regarding the Integrated Natural Resources Management Plan and Environmental Assessment for the U.S. Coast Guard Training Center in Cape May, New Jersey. First, let me apologize for the delay in my response. Your letter was temporarily misplaced during an office relocation. I hope that this response is still of value in your preparation of the INRMP/EA.

With regard to federally and state listed wildlife and plants located on site I notice, based on the attachment provided with your letter, that you have corresponded with the Natural Heritage Program. The list that they provide is comprehensive with respect to wildlife and we are not aware of additional wildlife species for which the base provides important habitat. Some of the species listed by NHP, specifically the long-legged wading birds have not nested on the site for several years, but suitable habitat may remain on the base.

As indicated in the NHP response, the Cape May Training Center does provide nesting habitat for the federally threatened/state endangered piping plover and the state endangered least tern. Any Natural Resource Management Plan must place a high priority on providing safe and productive nesting habitat for these imperiled beach nesting birds. We have worked closely with the U.S. Coast Guard over the past several years directly assisting with monitoring and management of these species. We believe the development of the INRMP presents an opportunity to stress the importance of the base to these species. The Coast Guard has done an admirable job of addressing the management needs of these species. We hope that the INRMP will continue the process of the Coast Guard assuming full responsibility for monitoring and management of beach nesting birds.

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If you have any questions or would like to discuss this further, please do not hesitate to contact me at the letterhead address or by telephone at: 908-735-9652, or by e-mail at djenkins@dep.state.nj.us

Sincerely,



C. David Jenkins, Jr.
Principal Zoologist
Endangered and Nongame Species Program

cc. A. Didun



In Reply Refer to:
ES-02/044

United States Department of the Interior

FISH AND WILDLIFE SERVICE

New Jersey Field Office
Ecological Services
927 North Main Street, Building D
Pleasantville, New Jersey 08232
Tel: 609/646 9310
Fax: 609/646 0352
<http://njfieldoffice.fws.gov> February 26, 2002



Gino J.M. Guimarro, Project Manager
e2M
10331 Democracy Lane
Fairfax, Virginia 22030

Dear Mr. Guimarro:

This responds to your January 16, 2002 request to the U.S. Fish and Wildlife Service (Service) for information on the presence of federally listed endangered and threatened species within the vicinity of the U.S. Coast Guard (USCG) Training Center Cape May (Training Center) located in Cape May City, Cape May County, New Jersey. The Service understands that the USCG is preparing an Integrated Natural Resources Management Plan (INRMP) and Environmental Assessment (EA) for the Training Center.

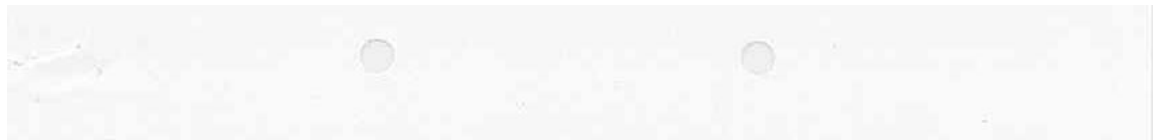
AUTHORITY

This response is provided pursuant to Section 7 of the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) (ESA) to ensure the protection of federally listed endangered and threatened species. These comments do not address all Service concerns for fish and wildlife resources and do not preclude separate review and comments by the Service pursuant to the December 22, 1993 Memorandum of Agreement among the U.S. Environmental Protection Agency, New Jersey Department of Environmental Protection (NJDEP), and the Service, if project implementation requires a permit from the NJDEP pursuant to the New Jersey Freshwater Wetlands Protection Act (N.J.S.A. 13:9B *et seq.*), or comments by the Service as afforded by the Fish and Wildlife Coordination Act (48 Stat. 401; 16 U.S.C. 661 *et seq.*), if project implementation requires a permit from the U.S. Army Corps of Engineers pursuant to the Clean Water Act of 1977 (33 U.S.C. 1344 *et seq.*); nor do they preclude comments on any forthcoming environmental documents pursuant to the National Environmental Policy Act of 1969 as amended (83 Stat. 852; 42 U.S.C. 4321 *et seq.*) (NEPA).

FEDERALLY LISTED SPECIES

Piping Plover

The federally listed (threatened) piping plover (*Charadrius melodus*) has been actively nesting



within the sandy beach portion of the Training Center in recent years. These small, territorial shorebirds are present on the New Jersey shore between March and August. Piping plovers nest above the high tide line, usually on sandy ocean beaches and barrier islands, but also on gently sloping foredunes, blowout areas behind primary dunes, washover areas cut into or between dunes, the ends of sandspits, and deposits of suitable dredged or pumped sand. Piping plover nests consist of a shallow scrape in the sand, frequently lined with shell fragments and often located near small clumps of vegetation. Piping plover adults and chicks feed on marine invertebrates such as worms, fly larvae, beetles, and crustaceans. Feeding areas include the intertidal zone of ocean beaches, ocean washover areas, mudflats, sandflats, wrack lines (organic ocean material left by high tide), and the shorelines of coastal ponds, lagoons, and salt marshes.

The piping plover is susceptible to a variety of impacts including: habitat disturbance associated with beach stabilization and renourishment projects; disturbance from humans, which can cause parent birds to desert the nests and prevent juvenile birds from feeding during critical periods in their development; harassment from pets, especially dogs; and loss of nests, eggs, and young to predators such as foxes, gulls, raccoons, and domestic cats. Beach activities such as jogging, walking dogs, flying kites, volleyball, fireworks events, sunbathing, and driving vehicles on the beach can adversely affect piping plovers.

Section 7(a)(1) directs federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for endangered and threatened species. In furtherance of Training Center obligations under Section 7(a)(1), the Service encourages the USCG to take lead responsibility for monitoring and management of piping plovers occurring on Training Center lands. While in past years the New Jersey Endangered and Nongame Species Program (ENSP) has been able to hire sufficient staff to cover Training Center beaches, responsibility for protection of federally listed species occurring on federal lands rests with the federal landowner. The Service and the ENSP will continue to provide assistance to the Training Center in ensuring the protection of piping plovers, and are available to meet with Training Center staff on-site.

To assist you in managing activities occurring within piping plover nesting and foraging areas, a copy of the Service's *Guidelines for Managing Recreational Activities in Piping Plover Breeding Habitat on the U.S. Atlantic Coast to Avoid Take Under Section 9 of the Endangered Species Act* (Guidelines) is enclosed. While the Guidelines were developed to assist municipal beach managers, information on pedestrian and vehicle management can be applied to federal lands as well. Management activities specified within the Guidelines should be incorporated in the INRMP. Additionally, the Service recommends that the following management actions be incorporated in the INRMP to ensure the protection of piping plovers:

- conduct annual monitoring of piping plover adults, nests, and young from March 15 to August 15;
- avoid waterfront construction activities that may directly or indirectly adversely affect piping plovers;

- conduct an annual survey of the Training Center's ocean beach between August 15 and September 15 for the presence or absence of seabeach amaranth, and report the results to the Service;
- if seabeach amaranth is found, avoid pedestrian or vehicle use within areas supporting the species; and
- ensure that vegetation control to enhance piping plover habitat does not adversely impact seabeach amaranth.

Except for the above-mentioned species and an occasional transient bald eagle (*Haliaeetus leucocephalus*) or roseate tern (*Sterna dougallii*), no other federally listed or proposed endangered or threatened flora or fauna under Service jurisdiction are known to occur within the vicinity of the Training Center. If additional information on federally listed species becomes available this determination may be reconsidered.

Current information regarding federally listed and candidate species occurring in New Jersey is enclosed, as well as addresses of State agencies that may be contacted for current site-specific information regarding federal candidate and State-listed species. The Service encourages federal agencies and other planners to consider federal candidate species in project planning.

COMPLIANCE WITH SECTION 7(a)(2) OF THE ESA

Threatened and endangered species and their habitats are afforded protection under Section 7(a)(2) of the ESA, which requires every federal agency, in consultation with the Service, to ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. An assessment of potential direct, indirect, and cumulative impacts is required for all federal actions that may affect listed species.

If construction activities or other actions are planned that may directly or indirectly affect the piping plover and/or seabeach amaranth, informal consultation with the Service should be initiated as early as possible during project planning. Through the informal consultation process, the Service will provide recommendations to avoid or minimize affects to federally listed species. If adverse effects cannot be avoided, formal consultation may be required.

OTHER SERVICE CONCERNS

The State-listed (endangered) least tern (*Sterna antillarum*) also nests on the Training Center beach. The Service understands that the Training Center has previously requested planning input from the ENSP. We recommend that the USCG continue to consult with the ENSP to manage the Training Center in a manner consistent with protection of the least tern and other State-listed and rare wildlife and plants.

The Service also recommends that the INRMP include a full discussion of the value of the Training Center's coastal wetlands, and a strong policy for avoiding impacts to wetlands to the maximum extent possible. Wetlands provide habitats for a variety of migratory and resident species of fish and wildlife. The Training Center's wetlands are particularly valuable as habitat for many species of birds that pass through the Cape May peninsula in large numbers during spring and fall migration. The Service discourages activities in and affecting these wetlands that would unnecessarily damage, degrade, or destroy the values associated with them. Information is enclosed regarding permit requirements for activities proposed in New Jersey's wetlands.

The Service appreciates the opportunity to provide comments regarding development of an INRMP for the Training Center. Please contact Annette Scherer or Lisa Solberg of my staff at (609) 646-9310, extensions 34 and 47 respectively, if you have any questions about the enclosed material or require further assistance regarding federally listed endangered or threatened species.

Sincerely,



John C. Staples
Assistant Supervisor

Enclosures

Table 1. Summary of Chick Mobility Data

Source	Location	Data
Patterson 1988 (p.40)	Maryland and Virginia	18 of 38 broods moved to feeding areas more than 100 meters from their nests; 5 broods moved more than 600 meters (distance measured parallel to wackline).
Cross 1989 (p.23)	Virginia	At three sites, observers relocated broods at mean distances from their nests of 153 m \pm 97m (44 observations, 14 broods), 32 m \pm 7 m (8 observations, 3 broods), and 492 m \pm 281 m (12 observations, 4 broods).
Coutu et al. 1990 (p.12)	North Carolina	Observations of 11 broods averaged 212 m from their nests; 3 broods moved 400-725 m from nest sites.
Strauss 1990 (p.33)	Massachusetts	10 chicks moved more than 200 m during first 5 days post-hatch while 19 chicks moved less than 200 meters during same interval.
Loefering 1992 (p.72)	Maryland	Distances broods moved from nests during first 5 days post-hatch averaged 195 m in Bay habitat (n=10), 141 m in Interior habitat (n=36), and 131 m in Ocean habitat (n=61). By 21 days, average movement in each habitat had, respectively, increased to 850 m (n=1), 464 m (n=10), and 187 m (n=69). One brood moved more than 1000 m from its nest.
Helvin et al. 1994	Massachusetts and New York	In 14 incidents in which 18 chicks were killed by vehicles, chicks were run over \leq 10 m to \leq 900 m from their nests. In 7 of these instances, mortality occurred \geq 200 m from the nest.

Table 2. Summary of Data on Distances at which Piping Plovers React to Disturbance

Source	Location	Data
Flushing of Incubating Birds by Pedestrians		
Fleming et al. 1988 (p.326)	Nova Scotia	Adults usually flushed from the nests at distances <40 m; however, great variation existed and reaction distances as great as 210 m were observed.
Cross 1990 (p.47)	Virginia	Mean flushing distances in each of two years were 47 m (n=181, range = 5 m to 300 m) and 25 m (n=214, range = 2 m to 100 m).
Loefering 1992 (p.61)	Maryland	Flushing distances averaged 78 m (n=43); range was 20 m to 174 m. Recommended use of 225 m disturbance buffers on his site.
Cross and Terwilliger 1993	Virginia	Mean flushing distance for all years on all sites (Virginia plover sites, 1986-91) was 63 m (n=201, SD=31, range = 7 m to 200 m). Differences among years were not significant, but differences among sites were.
Roopes 1993 (p.72)	Massachusetts	Mean flushing distance for incubating plovers was 24 m (n=31).
Disturbance to Non-Incubating Birds		
Roopes 1993 (p.89)	Massachusetts	Mean response distance (all ages, all behaviors) was 23 m for pedestrian disturbances (range = 10 m to 60 m), 40 m for vehicles (range = 30 m to 70 m), 46 m for dogs/pets (range = 20 m to 100 m), and 45 m for kites (range = 60 m to 120 m).
Goldin 1993 (p.74)	New York	Average flushing distance for adult and juvenile plovers was 18.7 m for pedestrian disturbances (n=585), 19.5 m for joggers (n=183), and 20.4 m for vehicles (n=111). Pedestrians caused chicks to flush at an average distance of 20.7 m (n=175), joggers at 32.3 m (n=37), and vehicles at 19.3 m (n=7). Tolerance of individual birds varied; one chick moved 260 m in direct response to 20 disturbances in 1 hour.



FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN NEW JERSEY



An **ENDANGERED** species is any species that is in danger of extinction throughout all or a significant portion of its range.

A **THREATENED** species is any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

	COMMON NAME	SCIENTIFIC NAME	STATUS
FISHES	Shortnose sturgeon*	<i>Acipenser brevirostrum</i>	E
REPTILES	Bog turtle	<i>Clemmys muhlenbergii</i>	T
	Atlantic Ridley turtle*	<i>Lepidochelys kempii</i>	E
	Green turtle*	<i>Chelonia mydas</i>	T
	Hawksbill turtle*	<i>Eretmochelys imbricata</i>	E
	Leatherback turtle*	<i>Dermochelys coriacea</i>	E
	Loggerhead turtle*	<i>Caretta caretta</i>	T
BIRDS	Bald eagle	<i>Haliaeetus leucocephalus</i>	T
	Piping plover	<i>Charadrius melodus</i>	T
	Roseate tern	<i>Sterna dougallii dougallii</i>	E
MAMMALS	Eastern cougar	<i>Felis concolor cougar</i>	E+
	Indiana bat	<i>Myotis sodalis</i>	E
	Gray wolf	<i>Canis lupus</i>	E+
	Delmarva fox squirrel	<i>Sciurus niger cinereus</i>	E+
	Blue whale*	<i>Balaenoptera musculus</i>	E
	Finback whale*	<i>Balaenoptera physalus</i>	E
	Humpback whale*	<i>Megaptera novaeangliae</i>	E
	Right whale*	<i>Balaena glacialis</i>	E
	Sei whale*	<i>Balaenoptera borealis</i>	E
	Sperm whale*	<i>Physeter macrocephalus</i>	E

	COMMON NAME	SCIENTIFIC NAME	STATUS
INVERTEBRATES	Dwarf wedgemussel	<i>Alasmodonta heterodon</i>	E
	Northeastern beach tiger beetle	<i>Cicindela dorsalis dorsalis</i>	T
	Mitchell saytr butterfly	<i>Neonympha m. mitchellii</i>	E+
	American burying beetle	<i>Nicrophorus americanus</i>	E+
PLANTS	Small whorled pogonia	<i>Isotria medeoloides</i>	T
	Swamp pink	<i>Helonias bullata</i>	T
	Knieskern's beaked-rush	<i>Rhynchospora knieskernii</i>	T
	American chaffseed	<i>Schwalbea americana</i>	E
	Sensitive joint-vetch	<i>Aeschynomene virginica</i>	T
	Seabeach amaranth	<i>Amaranthus pumilus</i>	T

STATUS:			
E	endangered species	PE	proposed endangered
T	threatened species	PT	proposed threatened
+	presumed extirpated**		

* Except for sea turtle nesting habitat, principal responsibility for these species is vested with the National Marine Fisheries Service.

** Current records indicate the species does not presently occur in New Jersey, although the species did occur in the State historically.

Note: for a complete listing of Endangered and Threatened Wildlife and Plants, refer to 50 CFR 17.11 and 17.12.

For further information, please contact: U.S. Fish and Wildlife Service
New Jersey Field Office
927 N. Main Street, Building D
Pleasantville, New Jersey 08232
Phone: (609) 646-9310
Fax: (609) 646-0352

Revised 12/06/00



State of New Jersey

James E. McGreevey
Governor

Department of Environmental Protection
Division of Parks and Forestry
Office of Natural Lands Management
Natural Heritage Program
P.O. Box 404
Trenton, NJ 08625-0404
Tel. #609-984-1339
Fax. #609-984-1427

Bradley M. Campbell
Acting Commissioner

February 1, 2002

Gino J. M. Giumarro
e2M
1109 E. Jefferson Street
Charlottesville, VA 22902

Re: U.S. Coast Guard Training Center Cape May Integrated Natural Resources Management Plan and Environmental Assessment

Dear Mr. Giumarro:

Thank you for your data request regarding rare species information for the above referenced project site in Cape May City, Cape May County.

The Natural Heritage Data Base has records for occurrences of piping plover, least tern and migratory raptor concentration site that may be on the site, and for snowy egret, black-crowned night-heron, yellow-crowned night-heron, glossy ibis, piping plover, coastal heron rookery and five rare plant species that may be in the immediate vicinity of the site. The attached lists provide more information about these occurrences. **Because some species are sensitive to disturbance or sought by collectors, this information is provided to you on the condition that no specific locational data are released to the general public. This is not intended to preclude your submission of this information to regulatory agencies from which you are seeking permits.**

Also attached is a list of rare species and natural communities that have been documented from Cape May County. This county list can be used as a master species list for directing further inventory work. If suitable habitat is present at the project site, these species have potential to be present. If you have questions concerning the wildlife records or wildlife species mentioned in this response, we recommend you contact the Division of Fish and Wildlife, Endangered and Nongame Species Program.

The Natural Heritage Program reviews its data periodically to identify priority sites for natural diversity in the State. Included as priority sites are some of the State's best habitats for rare and endangered species and natural communities. One of these sites is located within or near the areas you have outlined. Please refer to the enclosed Natural Heritage Priority Site Map for the location and boundary of this site. On the back of each Priority Site Map is a report describing the significance of the site.

PLEASE SEE THE ATTACHED 'CAUTIONS AND RESTRICTIONS ON NHP DATA'.

Thank you for consulting the Natural Heritage Program. The attached invoice details the

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Recycled Paper*

payment due for processing this data request. Feel free to contact us again regarding any future data requests.

Sincerely,

Herbert A. Lord

Herbert A. Lord
Data Request Specialist

cc: Thomas F. Breden
Lawrence Niles
NHP File No. 02-3807488



DEPARTMENT OF ENVIRONMENTAL PROTECTION

Division of Parks and Forestry
Office of Natural Lands Management
CN 404 Trenton New Jersey 08625
(609) 984-1339
FAX (609) 984-1427

TO: CONSULTANT

When sending in a Natural Heritage Data
Request, the attached form must be
completed and sent in with your request.

Thank you,
Natural Heritage Program



Natural Heritage Data Services



Established in 1984, the Natural Heritage Database is the state's most comprehensive, centralized source of information on rare plants, animals, and natural communities. The database is a compilation of information from a broad range of sources including museum and herbarium collection records, publications, knowledgeable experts, and fieldwork. It contains information collected by the Office of Natural Lands Management on rare plants, animals, and natural communities as well as data on rare animals provided by the Endangered and Nongame Species Program. The database is continuously updated and improved as new data is obtained. Information from this database is available to assist individuals in the preservation of habitat for rare species and natural communities.

Using the Database

Land-Use Planning

Resource planners can save time and money by referring to the database for comprehensive Natural Heritage data. By consulting the database early in the planning stages, planners can alleviate possible conflicts by determining whether the intended location for a given project includes known rare species occurrences. Municipalities and counties also can use the database information for inclusion in their natural resource inventories and open space plans.

Environmental Assessment and Permit Review

Database information can be used to plan and supplement field surveys that are conducted to assess impacts of projects on natural diversity. Reviewers of environmental impact statements and permit applications can consult the database to determine if impacts on known occurrences of protected species and communities have been assessed.

Natural Area Selection, Design, and Stewardship

Conservationists can use Natural Heritage data to identify the highest quality areas for natural diversity and those areas in most need of protection.

Information Available from Database

For any specified area in New Jersey, the Natural Heritage database can be searched for locational records of rare and endangered species and natural communities. The database contains more than 8000 locational records for rare and endangered plants, animals, and natural communities. The status of more than 750 plant and animal species and more than 50 natural communities are tracked by the database. This includes:

- Listed Federal Endangered Species
- Listed State Endangered Plant Species
- Listed State Endangered Wildlife
- Additional Plant Species of Concern
- Additional Nongame Animal Species
- Rare and Exemplary Natural Communities

To request data, write to the address below stating your data needs and include a completed Natural Heritage Data Request Form (see reverse side). Include the following information:

- Name and address of user or organization
- Type of data needed
- Copy of USGS quad with exact boundaries
- Explanation of how the information will be used

Time Frame for Response

Data requests are processed in the order in which they are received. The response time depends on the backlog at the time your request is logged in; however, the average turnaround time is 3-4 weeks. Due to the number of attachments, we cannot fax results. If you would like to have your response package returned by Federal Express, please include an account number with your request.

Fees

Fees are charged to cover the cost of providing data services. Minimum charge is \$20.00. Charges for searches exceeding one hour are charged in half-hour increments at \$20.00 per hour. A bill will be sent with the request response and payment should be made by check or money order payable to "Office of Natural Lands Management." A fee estimate can be given prior to initiating a search.

Send data requests to:

Office of Natural Lands Management
Natural Heritage Program
PO Box 404
22 South Clinton Avenue
Trenton, New Jersey 08625-0404
(609) 633-2765
Fax No.: (609) 984-1427

DEP - Division of Parks & Forestry, Office of Natural Lands Management
NATURAL HERITAGE DATA REQUEST FORM

This form is used to request a search of the Natural Heritage Database for records of rare or endangered species and natural communities on or near a project site. The Natural Heritage Program provides the information in order to assist the requestor in preserving habitat for rare and endangered species and natural communities.

To initiate a search, please provide: A) A letter explaining the project; B) A copy of a USGS quad map(s) delineating the bounds of the project site; C) A completed data request form.

Send completed request to: Office of Natural Lands Management, Natural Heritage Program, PO Box 404, 22 South Clinton Avenue, Trenton, NJ 08625-0404.

NAME _____

AGENCY _____

ADDRESS _____

PHONE _____

PROJECT OR SITE NAME _____

COUNTY (CHECK THOSE THAT APPLY):

ATLANTIC	BERGEN	BURLINGTON	CAMDEN	CAPE MAY	CUMBERLAND	ESSEX
GLOUCESTER	HUDSON	HUNTERDON	MERCER	MIDDLESEX	MONMOUTH	MORRIS
OCEAN	PASSAIC	SALEM	SOMERSET	SUSSEX	UNION	WARREN

USGS QUAD(S): _____

Any material supplied by the Office of Natural Lands Management will not be published without crediting the Natural Heritage Database as the source of the material. It is understood that there will be a charge of \$20.00 per hour for the services requested. An invoice will be sent with the request response and payment should be made by check or money order payable to "Office of Natural Lands Management."

Date Needed _____ Signature _____
(see reverse side of form)

FOR OFFICE USE ONLY				DATE RECEIVED
Item Code:	REG ____	ST ____	RTC ____	NC ____
	REGEO ____	STEO ____	RTCEO ____	NCEO ____
Hrs:	_____			
Project Code:	_____		Inv. #:	_____

NATURAL LANDS MANAGEMENT

CAUTIONS AND RESTRICTIONS ON NATURAL HERITAGE DATA

The quantity and quality of data collected by the Natural Heritage Program is dependent on the research and observations of many individuals and organizations. Not all of this information is the result of comprehensive or site-specific field surveys. Some natural areas in New Jersey have never been thoroughly surveyed. As a result, new locations for plant and animal species are continuously added to the data base. Since data acquisition is a dynamic, ongoing process, the Natural Heritage Program cannot provide a definitive statement on the presence, absence, or condition of biological elements in any part of New Jersey. Information supplied by the Natural Heritage Program summarizes existing data known to the program at the time of the request regarding the biological elements or locations in question. They should never be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. The attached data is provided as one source of information to assist others in the preservation of natural diversity.

This office cannot provide a letter of interpretation or a statement addressing the classification of wetlands as defined by the Freshwater Wetlands Act. Requests for such determination should be sent to the DEP Land Use Regulation Program, P.O. Box 401, Trenton, NJ 08625-0401.

This cautions and restrictions notice must be included whenever information provided by the Natural Heritage Database is published.

N.J. Department of Environmental Protection Division of Parks & Forestry

POSSIBLY ON PROJECT SITE									
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN									
THE NEW JERSEY NATURAL HERITAGE DATABASE									
1	31 JAN 2002								
NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL GRANK	SRANK	DATE OBSERVED	IDENT.	LOCATION	
*** Vertebrates									
CHARADRIUS MELODIUS	PIPING PLOVER	L?	E	G3	S1B	1996-06-??	Y	COAST GUARD BASE IN CAPE MAY CITY, SEWELL POINT,	
STERNA ANTHILLASUM	LEAST TERN		E	G4	S1B	1996-07-??	Y	UNITED STATES COAST GUARD TRAINING CENTER, POVERTY BEACH.	
*** Other types									
MIGRATORY RAPTOR CONCENTRATION	MIGRATORY RAPTOR CONCENTRATION								
SITE	SITE								
				G?	S1	2000-??-??	Y	ALL SUITABLE HABITAT (NON-DEVELOPED) ON THE LOWER 10 KILOMETERS OF THE CAPE MAY PENINSULA, BORDERED TO THE NORTH BY THE 39 01'30" LATITUDE LINE, TO THE WEST BY THE DELAWARE BAY, AND TO THE EAST BY THE ATLANTIC OCEAN.	
3	Records Processed								

IMMEDIATE VICINITY OF PROJECT SITE						
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN THE NEW JERSEY NATURAL HERITAGE DATABASE						
NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL GRANK STATUS	SPRINK	DATE OBSERVED IDENT. LOCATION
*** Vertebrates						
	CHASABRIUS MELCHUS	LT	E	Q3	S1B	1996-06-79 Y ELECTRONIC BASE SOUTH OF WILDMOOD GABLES (ALSO KNOWN AS TWO MILE BEACH).
	EDARTIA THULA		S/S	Q5	S3B, S4N	1983-06-72 Y CAPE MAY INLET, LOWER TWP. AREA SOUTH OF TOLL BRIDGE, SOUTHWEST OF OCEAN DRIVE.
NYCTANASSA VIOLACEA	YELLOW-CROWNED NIGHT-HERON		T/T	Q5	S2B	1983-06-07 Y CAPE MAY INLET, LOWER TWP. AREA S. OF THE TOLL BRIDGE, SW OF OCEAN DRIVE, ALONG THE INLET SHORE.
NYCTICORAX NYCTICORAX	BLACK-CROWNED NIGHT-HERON		T/S	Q5	S3B, S4N	1983-06-79 Y CAPE MAY INLET, LOWER TWP. AREA SOUTH OF TOLL BRIDGE, SW OF OCEAN DRIVE.
PLERADIS FALCINELLUS	GLOSSY IBIS		D/S	Q5	S3B, S4N	1983-06-72 Y CAPE MAY INLET, LOWER TWP. AREA SOUTH OF TOLL BRIDGE, SOUTHWEST OF OCEAN DRIVE.
*** Other types						
COASTAL HERON ROOKERY	COASTAL HERON ROOKERY			QU	S3	1983-06-79 Y CAPE MAY INLET, LOWER TWP. AREA S. OF TOLL BRIDGE, SW OF OCEAN DRIVE.
*** Vascular plants						
CHENOPODIUM HERLANDIERI VAR MACROCALYCIUM	LARGE-CALYX GOOSEFOOT			Q4	S2	1993-10-15 Y CA. 0.6 MILES SOUTH OF OCEAN DRIVE, U.S. COAST GUARD STATION, TWO MILE BEACH; ALONG DUNES, NORTH OF CANAL.

2
31 JAN 2002

IMMEDIATE VICINITY OF PROJECT SITE
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL GRANK STATUS	SRANK	DATE OBSERVED IDENT.	LOCATION
CUSCUTA POLYSCORUM	SWARTWOOD DODDER			G5	S2	1993-10-15	CA. 0.1 MILES SOUTH OF OCEAN DRIVE, U.S. COAST GUARD STATION, TWO MILE BEACH.
HYDROXYLITE VERTICILLATA VAR. VERTICILLATA	SHRUBLED MARSH-PENNYWORT			S5T5	S2	1993-10-15	CA. 0.3 MILES SOUTH OF OCEAN DRIVE, U.S. COAST GUARD STATION, TWO MILE BEACH. ALONG ACCESS ROAD TO TONER.
OENOTHERA OAKESIANA	OAKES' EVENING-PRIMROSE			O4G5Q	S2	1993-10-15	CA. 0.6 MILES SOUTH OF OCEAN DRIVE, U.S. COAST GUARD STATION, TWO MILE BEACH; ALONG DUNES NORTH OF CANAL.
FUCCINELLIA FUSCICOLATA	SALT MARSH ALFALI GRASS			Q0	S2	1958-06-24	NEAR BEACH, 2.0 MI W OF W. CAPE MAY PHYTOGEOLOGY RESEARCH VOUCHER.

11 Records Processed

Frequently Asked Questions About Natural Heritage Priority Sites

What are Natural Heritage Priority Sites?

Through its Natural Heritage Database, the Office of Natural Lands Management (ONLM) identifies critically important areas to conserve New Jersey's biological diversity. The database provides detailed, up-to-date information on rare species and natural communities to planners, developers, and conservation agencies for use in resource management, environmental impact assessment, and both public and private land protection efforts.

Using the database, ONLM has identified Natural Heritage Priority Sites that represent some of the best remaining habitat for rare species and exemplary natural communities in the state. These areas should be considered to be top priorities for the preservation of biological diversity in New Jersey. If these sites become degraded or destroyed, we may lose some of the unique components of our natural heritage.

ONLM has identified 389 priority sites over the course of more than 10 years. We have received assistance from many partner individuals and agencies over this time. The Nature Conservancy and the DEP Endangered and Nongame Species Program have provided key information or assisted with the delineation of a number of the sites.

How are Natural Heritage Priority Site maps used in conservation of biological diversity?

Natural Heritage Priority Site maps are used by individuals and agencies concerned with the protection and management of land. The maps have been used by municipalities preparing natural resource inventories; public and private conservation organizations preparing open space acquisition goals; land developers and consultants identifying environmentally sensitive lands; and public and private landowners developing land management plans.

Natural Heritage Priority Sites contain some of the best and most viable occurrences of endangered and threatened species and natural communities, but they do not cover all known habitat for endangered and threatened species in New Jersey. If

information is needed on whether or not endangered or threatened species have been documented from a particular piece of land, a Natural Heritage Database search can be requested by contacting the Office of Natural Lands Management at the address below.

What do the boundaries of the sites contain?

The boundaries of each Natural Heritage Priority Site are drawn to encompass critical habitat for the rare species or natural communities. Often the boundaries extend to include additional buffer lands that should be managed to protect the habitat. A justification for the boundary is provided for each site. The term "primary bounds" is sometimes used to refer to boundaries enclosing critical habitat. The term "secondary bounds" is sometimes used to refer to boundaries enclosing additional buffer. In maps where both primary and secondary boundaries are described, only the outermost boundary is provided in the mapping.

What is the background map that the sites are drawn upon?

The sites are portrayed on background maps produced from a digital copy of the U.S. Geological Survey 7.5 minute topographic maps. The background maps contain topographic lines as well as streams, lakes, roads, towns and place names. These background maps do not always reflect recent changes in land development. Some may be more than 20 years old. Some sites appear to be shifted in position against this topo map. This shift is due to the fact that most sites have been digitized against a background of rectified aerial photography, and some of the digitized USGS topo maps do not align with this photography.

What do "public lands" depict on the maps?

The "public lands" shaded on these maps are state-owned open space lands that have been digitized as a GIS coverage by the state Green Acres Program. This information is provided to show patterns of State land ownership in the vicinity of the Priority Site. The public lands are areas such as State Parks and Forests, Wildlife Management Areas, and Natural Lands Trust preserves. They do not currently include lands owned by other state

agencies, federal, county or municipal governments or nonprofit conservation organizations. This GIS coverage is constantly being updated, and therefore future editions of the maps will likely contain additional public lands that are not currently mapped as such.

What is the biodiversity significance rank and how is it used?

Each site is ranked according to its significance for biological diversity using a scale developed by The Nature Conservancy and the network of Natural Heritage Programs. The ranks can be used to distinguish between sites that are of global significance for conservation of biological diversity vs. those that are of state significance. The scale ranges from B1 to B5 with sites ranked B1-B3 generally being of global significance and sites ranked B4-B5 being of state significance. The specific definitions for each rank are as follows:

B1 - Outstanding significance, generally the "last of the least" in the world, such as the only known occurrence of any element (species or natural community), the best or an excellent occurrence of an element ranked critically imperiled globally, or a concentration (4+) of good or excellent occurrences of elements that are imperiled or critically imperiled globally. The site should be viable and defensible for the elements or ecological processes contained.

B2 - Very high significance, such as the most outstanding occurrence of any natural community. Also includes areas containing other occurrences of elements that are critically imperiled globally, a good or excellent occurrence of an element that is imperiled globally, an excellent occurrence of an element that is rare globally, or a concentration (4+) of good occurrences of globally rare elements or viable occurrences of globally imperiled elements.

B3 - High significance, such as any other viable occurrence of an element that is globally imperiled, a good occurrence of a globally rare element, an excellent occurrence of any natural community, or a concentration (4+) of good or excellent occurrences of elements that are critically imperiled in the State.

B4 - Moderate significance, such as a viable occurrence of a globally rare element, a good occurrence of any natural community, a good or excellent occurrence or only viable state occurrence of an element that is critically imperiled in the State, an excellent occurrence of an element that is imperiled in the State, or a concentration (4+) of good occurrences of elements that are imperiled in the State or excellent occurrences of elements that are rare in the State.

B5 - Of general biodiversity interest.

How can I obtain Natural Heritage Priority Site maps for an area of interest to me?

Natural Heritage Priority Site hard copy maps can be obtained by submitting a written request accompanied by a check or money order made payable to the Office of Natural Lands Management at the following address:

Office of Natural Lands Management
P.O. Box 404
Trenton, NJ 08625-0404
Phone: 609-984-1339; Fax: 609-984-1427; Email: ONLM@dep.state.nj.us

Individual 8.5" X 11" maps are available at the following rate:

1 - 10 site maps & reports:	\$1.50/site
11 - 20 site maps & reports:	\$1.00/site
> 20 sites:	\$0.50/site

Full sets of the June 1999 atlas (389 sites) are available for \$40

Digital GIS Coverage of Natural Heritage Priority Sites

A final digital version of the ArcView GIS file of the Natural Heritage Priority Sites will be available in the near future. Until then, a beta test version of the digital files can be obtained on the internet at the following address:

<http://www.state.nj.us/dep/gis/> -Click on "GIS Data Downloads" and then "Select a data layer" and then "statewide". There is no charge for downloading the GIS data.

How often are the maps updated?

The Natural Heritage Priority Site information is constantly being updated in the Natural Heritage Database. New sites will be added and some of the boundaries will be revised in the next edition of the maps, to be made available in October 1999.

August 13, 1999



NJ Department of Environmental Protection
Division of Parks and Forestry

Natural Lands Management





Natural Heritage Priority Site
Two Mile Beach Site
Cape May County



NJ Department of Environmental Protection
Division of Parks and Forestry
Natural Lands Management

0.3 0 0.3 Miles

 Priority Site
 Public Land



Natural Heritage Priority Site Two Mile Beach Site

Locational Information

Quad Name: Wildwood ; Cape May
County: Cape May
Municipality: Lower Twp ; Cape May City

Description of Site

This site is on parts of two adjacent barrier islands (Cape May and Wildwood) on the Atlantic Ocean side of Cape May peninsula. Communities include marine intertidal sand beach, coastal dune grass, coastal dune shrubland, coastal dune forest, and salt marsh.

Boundary Justification

Primary bounds are drawn to include beach and dune habitat used by State Endangered birds, and rare coastal dune grass, coastal dune shrubland and coastal dune forest communities. Secondary bounds include adjacent salt marsh and disturbed but undeveloped portions of the US Coast Guard Station - Cape May Unit.

Biodiversity Rank **B2**

Contains good and excellent populations of a globally rare State Endangered bird species, and additional occurrences of State Endangered and Threatened birds. Contains fair to good (but small) examples of rare coastal dune grass, coastal dune shrubland and coastal dune forest communities.



NJ Department of Environmental Protection
Division of Parks and Forestry
Natural Lands Management

July, 2001

Site Code: S.USNJHP1*556

EXPLANATIONS OF CODES USED IN NATURAL HERITAGE REPORTS

FEDERAL STATUS CODES

The following U.S. Fish and Wildlife Service categories and their definitions of endangered and threatened plants and animals have been modified from the U.S. Fish and Wildlife Service (F.R. Vol. 50 No. 188; Vol. 61, No. 40; F.R. 50 CFR Part 17). Federal Status codes reported for species follow the most recent listing.

LE	Taxa formally listed as endangered.
LT	Taxa formally listed as threatened.
PE	Taxa already proposed to be formally listed as endangered.
PT	Taxa already proposed to be formally listed as threatened.
C	Taxa for which the Service currently has on file sufficient information on biological vulnerability and threat(s) to support proposals to list them as endangered or threatened species.
S/A	Similarity of appearance species.

STATE STATUS CODES

Two animal lists provide state status codes after the Endangered and Nongame Species Conservation Act of 1973 (N.S.S.A. 23:2A-13 et. seq.): the list of endangered species (N.J.A.C. 7:25-4.13) and the list defining status of indigenous, nongame wildlife species of New Jersey (N.J.A.C. 7:25-4.17(a)). The status of animal species is determined by the Nongame and Endangered Species Program (ENSP). The state status codes and definitions provided reflect the most recent lists that were revised in the New Jersey Register, Monday, June 3, 1991.

D	Declining species—a species which has exhibited a continued decline in population numbers over the years.
E	Endangered species—an endangered species is one whose prospects for survival within the state are in immediate danger due to one or many factors – a loss of habitat, over exploitation, predation, competition, disease. An endangered species requires immediate assistance or extinction will probably follow.
EX	Extirpated species—a species that formerly occurred in New Jersey, but is not now known to exist within the state.
I	Introduced species—a species not native to New Jersey that could not have established itself here without the assistance of man.
INC	Increasing species—a species whose population has exhibited a significant increase, beyond the normal range of its life cycle, over a long term period.
T	Threatened species—a species that may become endangered if conditions surrounding the species begin to or continue to deteriorate.
P	Peripheral species—a species whose occurrence in New Jersey is at the extreme edge of its present natural range.
S	Stable species—a species whose population is not undergoing any long-term increase/decrease within its natural cycle.
U	Undetermined species—a species about which there is not enough information available to determine the status.

Status for animals separated by a slash(/) indicate a dual status. First status refers to the state breeding population, and the second status refers to the migratory or winter population.

Plant taxa listed as endangered are from New Jersey's official Endangered Plant Species List N.J.S.A. 131B-15.151 et seq.

E Native New Jersey plant species whose survival in the State or nation is in jeopardy.

REGIONAL STATUS CODES FOR PLANTS

LP Indicates taxa listed by the Pinelands Commission as endangered or threatened within their legal jurisdiction. Not all species currently tracked by the Pinelands Commission are tracked by the Natural Heritage Program. A complete list of endangered and threatened Pineland species is included in the New Jersey Pinelands Comprehensive Management Plan.

EXPLANATION OF GLOBAL AND STATE ELEMENT RANKS

The Nature Conservancy has developed a ranking system for use in identifying elements (rare species and natural communities) of natural diversity most endangered with extinction. Each element is ranked according to its global, national, and state (or subnational in other countries) rarity. These ranks are used to prioritize conservation work so that the most endangered elements receive attention first. Definitions for element ranks are after The Nature Conservancy (1982: Chapter 4, 4.1-1 through 4.4.1.3-3).

GLOBAL ELEMENT RANKS

- G1 Critically imperiled globally because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extinction.
- G2 Imperiled globally because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extinction throughout its range.
- G3 Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g., a single western state, a physiographic region in the East) or because of other factors making it vulnerable to extinction throughout its range; with the number of occurrences in the range of 21 to 100.
- G4 Apparently secure globally; although it may be quite rare in parts of its range, especially at the periphery.
- G5 Demonstrably secure globally; although it may be quite rare in parts of its range, especially at the periphery.
- GH Of historical occurrence throughout its range i.e., formerly part of the established biota, with the expectation that it may be rediscovered.
- GU Possibly in peril range-wide but status uncertain; more information needed.
- CX Believed to be extinct throughout range (e.g., passenger pigeon) with virtually no likelihood that it will be rediscovered.
- G? Species has not yet been ranked.

STATE ELEMENT RANKS

- S1 Critically imperiled in New Jersey because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres). Elements so ranked are often restricted to very specialized conditions or habitats and/or restricted to an extremely small geographical area of the state. Also included are elements which were formerly more abundant, but because of habitat destruction or some other critical factor of its biology, they have been demonstrably reduced in abundance. In essence, these are elements for which, even with intensive searching, sizable additional occurrences are unlikely to be discovered.

- S2 Imperiled in New Jersey because of rarity (6 to 20 occurrences). Historically many of these elements may have been more frequent but are now known from very few extant occurrences, primarily because of habitat destruction. Diligent searching may yield additional occurrences.
- S3 Rare in state with 21 to 100 occurrences (plant species in this category have only 21 to 50 occurrences). Includes elements which are widely distributed in the state but with small populations/acreage or elements with restricted distribution, but locally abundant. Not yet imperiled in state but may soon be if current trends continue. Searching often yields additional occurrences.
- S4 Apparently secure in state, with many occurrences.
- S5 Demonstrably secure in state and essentially ineradicable under present conditions.
- SA Accidental in state, including species (usually birds or butterflies) recorded once or twice or only at very great intervals, hundreds or even thousands of miles outside their usual range; a few of these species may even have bred on the one or two occasions they were recorded; examples include European strays or western birds on the East Coast and vice-versa.
- SE Elements that are clearly exotic in New Jersey including those taxa not native to North America (introduced taxa) or taxa deliberately or accidentally introduced into the State from other parts of North America (adventive taxa). Taxa ranked SE are not a conservation priority (viable introduced occurrences of G1 or G2 elements may be exceptions).
- SH Elements of historical occurrence in New Jersey. Despite some searching of historical occurrences and/or potential habitat, no extant occurrences are known. Since not all of the historical occurrences have been field surveyed, and unsearched potential habitat remains, historically ranked taxa are considered possibly extant, and remain a conservation priority for continued field work.
- SP Element has potential to occur in New Jersey, but no occurrences have been reported.
- SR Elements reported from New Jersey, but without persuasive documentation which would provide a basis for either accepting or rejecting the report. In some instances documentation may exist, but as of yet, its source or location has not been determined.
- SRF Elements erroneously reported from New Jersey, but this error persists in the literature.
- SU Elements believed to be in peril but the degree of rarity uncertain. Also included are rare taxa of uncertain taxonomical standing. More information is needed to resolve rank.
- SX Elements that have been determined or are presumed to be extirpated from New Jersey. All historical occurrences have been searched and a reasonable search of potential habitat has been completed. Extirpated taxa are not a current conservation priority.
- SXC Elements presumed extirpated from New Jersey, but native populations collected from the wild exist in cultivation.
- SZ Not of practical conservation concern in New Jersey, because there are no definable occurrences, although the taxon is native and appears regularly in the state. An SZ rank will generally be used for long distance migrants whose occurrences during their migrations are too irregular (in terms of repeated visitation to the same locations), transitory, and dispersed to be reliably identified, mapped and protected. In other words, the migrant regularly passes through the state, but enduring, mappable element occurrences cannot be defined.

Typically, the SZ rank applies to a non-breeding population (N) in the state – for example, birds on migration. An SZ rank may in a few instances also apply to a breeding population (B), for example certain lepidoptera which regularly die out every year with no significant return migration.

Although the S2 rank typically applies to migrants, it should not be used indiscriminately. Just because a species is on migration does not mean it receives an S2 rank. S2 will only apply when the migrants occur in an irregular, transitory and dispersed manner.

- B Refers to the breeding population of the element in the state.
- N Refers to the non-breeding population of the element in the state.
- T Element ranks containing a "T" indicate that the infraspecific taxon is being ranked differently than the full species. For example *Stachys palustris* var. *homotricha* is ranked "G2T7 SH" meaning the full species is globally secure but the global rarity of the var. *homotricha* has not been determined; in New Jersey the variety is ranked historic.
- Q Elements containing a "Q" in the global portion of its rank indicates that the taxon is of questionable, or uncertain taxonomical standing, e.g., some authors regard it as a full species, while others treat it at the subspecific level.
- .1 Elements documented from a single location.

Note: To express uncertainty, the most likely rank is assigned and a question mark added (e.g., G2T). A range is indicated by combining two ranks (e.g., G1G2, S1S3).

IDENTIFICATION CODES

These codes refer to whether the identification of the species or community has been checked by a reliable individual and is indicative of significant habitat.

- Y Identification has been verified and is indicative of significant habitat.
- BLANK Identification has not been verified but there is no reason to believe it is not indicative of significant habitat.
- ? Either it has not been determined if the record is indicative of significant habitat or the identification of the species or community may be confusing or disputed.

Revised September 1998

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CAPE MAY COUNTY
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

*** Vertebrates

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SENRK
ACCIPITER COOPERII	COOPER'S HAWK		T/T		05	\$1B, \$4N
AMBYSTOMA TIGRINUM TIGRINUM	EASTERN TIGER SALAMANDER		E		05T5	\$2
AMPHISPANUS SAVANAHARUM	GRASSHOPPER SPARROW		T/S		05	\$2B
ANDRA HERODIAS	GREAT BLUE HERON		S/S		05	\$2B, \$4N
BAPTOMIA LONGICAUDA	UPLAND SANDPEPER		E		05	\$1B
BUTEO LINEATUS	RED-SHOULDERED HAWK		E/T		05	\$1B, \$2N
CALIDRIS CANADENSIS	RED KNOT	LT *	T		05	\$3N
CHAMAECRUS NUCLOUS	FLYING PLOVER		E		03	\$1B
CIRCUS CYANERUS	NORTHERN HARRIER		E/U		05	\$1B, \$3N
CISTOTHORUS PLATENSIS	SEDOG WREN		E		05	\$1B
CLEMENS MUEHLERSCILL	BOG TURTLE	LT	E		03	\$2
CROTALUS HORRIDUS HORRIDUS	TIMBER SALTSTWAKE		E		04T4	\$2
BOULCHONIA ORYZIVORUS	BOGOLINK		T/T		05	\$2B
ROBERTIA CERULEA	LITTLE BLUE HERON		S/S		05	\$2B
ROBERTIA THULA	SNOW BERT		S/S		05	\$1B, \$4N
SCAROTIA TRICOLOR	TRICOLOR HERON		INC/S		05	\$3B
EMPHYSAS PASCIATUS	FIVE-LINED SKINK		U		05	\$3
FALCO PERRILLINUS	PEREGRINE FALCON		E		04	\$1B, \$7N
HALIAEETUS LEUCOCEPHALUS	HAUD EAGLE	LT	E		04	\$1B, \$2N
HYLA ANDERSONII	PINE BARKER'S TREEFROG		E		05	\$3
HYLA CHRYSOCHELIS	COPE'S GRAY TREEFROG		E		05	\$2
IXOBRYCHUS EXILIS	LEAST BITTERN		D/S		05	\$1B
LATERALUS JAMAICENSIS	BLACK BAIL		T/T		04	\$2B
LYNX RUFUS	BOBCAT		E		05	\$3
MELANERPIS BETHROCEPHALUS	RED-HEADED WOODPECKER		T/T		05	\$2B, \$2N
NYCTANASSA VIOLACEA	YELLOW-CROWNED NIGHT-HERON		T/T		05	\$2B
NYCTICORAX NYCTICORAX	BLACK-CROWNED NIGHT-HERON		T/S		05	\$1B, \$4N
SPANDION HALIAETUS	OSPREY		T/T		05	\$2B

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CAPE MAY COUNTY
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SEANK
PASSERCUIDUS SAMMICHENSIS	IFSMITH SPARROW		T/T		G5T2	S3N
PRINCEPS	NORTHERN PINE SHAKE		T		G4T4	S3
PITUCOPHIS MELANOLEUCUS	GLASSY IBIS		D/S		G5	S3B, S4N
PLEGADIS FALCINELLUS	BLACK SKIMMER		S		G5	S1B
RYNCHOPS NIGER	LEAST TERN		S		G4	S1B
STERNA ANTILLARUM	COMMON TERN		D/S		G5	S3B
STERNA HIRUNDO	BARRED OWL		T/T		G5	S3B
STRIX VARIA	SOUTHERN BOG LEMMING		U		G5	S2
SYNAPTOMYS COOPERI						
*** Ecosystems						
CAPE MAY LOWLAND SWAMP	CAPE MAY LOWLAND SWAMP				G7	S1?
COASTAL DUNE WOODLAND	COASTAL DUNE WOODLAND				G2G3	S1
COASTAL PLAIN INTERMITTENT POND	VERNAL POND				G3?	S2S3
FRESHWATER TIDAL MARSH COMPLEX	FRESHWATER TIDAL MARSH COMPLEX				G4?	S3?
MARITIME FOREST	MARITIME FOREST				G3?	S1
*** Invertebrates						
ANAX LONGIPES	CORNET DARNER				G5	S2S3
CALLIOPHYS HENRICI	HENRY'S ELFIN				G5	S3S4
CALLIOPHYS IRUS	FROSTED ELFIN				G3	S2S3
CANTINELLA VAGANS	MUDWARK AMBERSNAIL				G7	S1S3
CATOCMA PRETIOSA PRETIOSA	PRECIOUS UNDERWING				G4T2T3	S2S3
CELIPTHEMIS MARTHA	MARTHA'S PENNANT				G4	S1S4
CELIPTHEMIS VERNA	DOUBLE-RINGED PENNANT				G5	S2
CICINDELA DORSALIS DORSALIS	NORTHEASTERN BEACH TIGER BEETLE	LT	S		G4T2	S1

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CAPE MAY COUNTY
PLANT SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SPANK
CICINDELA DORSALIS MEDIA	SOUTHEASTERN BEACH TIGER				G4T4	S1S2
CISTHENE KENTUCKIENSIS	BEETLE				G4	S1
CITREONIA BEZALIS	KENTUCKY LICHEN MOTH				G5	S3
CUCULLIA ALPABATA	REAL MOTH				G4	S27
EMALLAGRA PICTUM	SCARLET BLUET				G3	S3
EMALLAGRA RECURVATUM	PINE BARRERS BLUET				G3	S3
PARONTA RUBRIPENNIS	PINK STEAK				G3G4	S3
GASTROSCOTIA PELLUCIDA	SLIM SINGLETOOTH				G4G5	S2S3
IDAEA ORFUSARIA	RIPPLED WAVE				G4G5	S2S4
LIBELLULA AXILENA	BAR-WINGED SKIMMER				G5	S2S3S4, S2
MEROPLEON COSMION	A NOCTUID MOTH				G4	S1S2
METRABANTHIS PILORARIA	COASTAL DOG METRABANTHIS				G3G4	S3S4
METRABANTHIS SP 1	A GEOMETRID MOTH				G3	S2
NEOHEILIX MAJOR	SOUTHEASTERN WHITELEAF				G4G5	S2S3
PAPAIPESA MARITIMA	MARITIME SUNFLOWER BORER				G4	S1
PAPAIPESA STENOCELEIS	CHAIN FERN BORER MOTH				G4	S3
PONTIA PROTOICE	CHECKERED WHITE				G4	S1
PROBLEMA BULENTIA	RARE SKIPPER				G4G3	S2
SCOTOCHLOA PROVOCANS	TRESTOP EMBROID				G4	S2S3
SUCCINEA CAPESTRIS	CRINKLED AMBERSMALL				G4	S1S2
SYMPLECTRUM AMBIGUUM	BLUE-FACED MEMPHIAN				G5	S2
TALE CUREMA	A NOCTUID MOTH				G3G4	S1
*** Nonvascular plants						
SPHAGNUM MACROPHYLLUM	SPHAGNUM				G3	S2
*** Other types						
BAUD EAGLE WINTERING SITE	BAUD EAGLE WINTERING SITE				G2	S7

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CAPE MAY COUNTY
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SEANK
PASSERCUIDUS SAMMICHENSIS	IFSMITH SPARRON		T/T		G5T2	S3N
PRINCEPS	NORTHERN PINE SHAKE		T		G4T4	S3
PITUOPHIS MELANOLEUCUS	GLASSY IBIS		D/S		G5	S3B, S4N
PLEGADIS FALCINELLUS	BLACK SKIMMER		S		G5	S1B
RYNCHOPS NIGER	LEAST TERN		D/S		G4	S1B
STERNA ANTILLARUM	COMMON TERN		T/T		G5	S3B
STERNA HIRUNDO	BARRED OWL		U		G5	S3B
STRIX VARIA	SOUTHERN BOG LEMMING				G5	S2
SYNAPTOMYS COOPERI						
*** Ecosystems						
CAPE MAY LOWLAND SWAMP	CAPE MAY LOWLAND SWAMP				G7	S1?
COASTAL DUNE WOODLAND	COASTAL DUNE WOODLAND				G2G3	S1
COASTAL PLAIN INTERMITTENT POND	VERNAL FOND				G3?	S2S3
FRESHWATER TIDAL MARSH COMPLEX	FRESHWATER TIDAL MARSH COMPLEX				G4?	S3?
MARITIME FOREST	MARITIME FOREST				G3?	S1
*** Invertebrates						
ANAX LONGIPES	CORNET DARNER				G5	S2S3
CALLIOPHYS HENRICI	HENRY'S ELFIN				G5	S3S4
CALLIOPHYS IRUS	FROSTED ELFIN				G3	S2S3
CANTINELLA VAGANS	MUDWARK AMBERSNAIL				G7	S1S3
CATOCOLA PRETIOSA PRETIOSA	PRECIOUS UNDERWING				G4T2T3	S2S3
CELTHERMIS MARTHA	MARTHA'S PENNANT				G4	S1S4
CELTHERMIS VERNA	DOUBLE-RINGED PENNANT				G5	S2
CICINDELA DORSALIS DORSALIS	NORTHEASTERN BEACH TIGER BEETLE	LT	S		G4T2	S1

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CAPE MAY COUNTY
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK
CHENOPODIUM BERLANDIERI VAR. MACROCALYX	LARGE-CLYX GOOSEFOOT				G4	S2
CHRISTUS VIRGINIANUS	VIRGINIA THRISTLE		R		G1	S1
CLAISTES DIVARICATA	SPREADING POONIA		R	LP	G4	S1
CLITORIA MARITIMA	BUTTERFLY-PEA		R		G5	S1
COELOMACHIS RUPESTRIS	WRINKLED JOINTWEASS		R		G5	S1
CROTON WILDENOWII	ELIPTICAL RUSHFOLI			LP	G5	S2
CUSCUTA INDECORA	COLLARED DODDER		R		G51214	S1.1
CUSCUTA POLYGERON	SMARTERD DODDER				G5	S2
CYPERUS LANCASTRIENSIS	LANCASTER FLAT SEDGE		R		G5	S1
CYPERUS POLYSTACHYOS	COAST FLAT SEDGE		R		G515	S1
CYPERUS REFRACTUS	REFLEXED FLAT SEDGE		R		G5	S1
CYPERUS RETROFRACTUS	ROUGH FLATSEED		R		G5	S1
DESMODIUM STRICTUM	PINELAND TICK-TREEFOLI			LP	G4	S2
DIOCLIA VIRGINIANA	LARGER BUTTOMBERD		R		G515	S1
DIOSCOREA VILLOSA VAR. HIRTICULUS	Hairy-STEM WILD YAM				G51510	S2
ELATINE AMERICANA	AMERICAN WATERMORT				G4	S2
ELBOCHAEIS BRITTONII	BRITTON'S SPIKE-RUSH		R		G405	S1
ELBOCHAEIS MELANOCARPA	BLACK-FRUIT SPIKE-RUSH		R		G4	S1
ELBOCHAEIS QUADRANGULATA	ANGLED SPIKE-RUSH		R		G4	S2
ELBOCHAEIS TORTILLIS	TWISTED SPIKE-RUSH		R		G5	S1
ERIOCAULON PARKERI	PARKER'S PIPEMORT				G3	S2
ERIOPOHORUM TENNILLUM	ROUGH COTTON-GRASS		R		G5	S1
ERTROSION AQUATICUM VAR. AQUATICUM	WASH RATTLESNAKE-MASTER				G414	S3
EUPATORIUM AROMATICUM VAR. AROMATICUM	SMALLER WHITE SNAREFOOT				G515	S1
EUPATORIUM CAPILLIFOLIUM	DOG-FENNEL, THROUGHTSMORT		R		G5	S2
EUPATORIUM RESINOSUM	FINE BARREN BONESSET		R	LP	G3	S2

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CAPE MAY COUNTY
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK
POLYCORDUM SETACEUM VAR	BRISTLY SMARTWEED				G5T4T5	S2
SETACEUM						
POPULUS HETEROPHYLLA	SWAMP COTTONWOOD				G5	S2
POPULUS ANGSTIFOLIA	CHICKASAW PLUM		E		G5T4T5	S2
POCCINELLIA FASCICULATA	SALT MARSH ALFALI GRASS				G5	S2
QUERCUS MICHAUXII	BASKET OAK				G5	S3
QUERCUS NIGRA	WATER OAK		E		G5	S1
RHEXIA ARISTOSA	ARMED MEADOW BEAUTY		E	LP	G3	S1
RHEXIA INTERIOR	SHOWY MEADOW BEAUTY		E		G5T4T5	S1
RHODODENDRON ATLANTICUM	DWARF AZALEA		E		G4G5	S1
RHYNCHOSPORA FILIFOLIA	THREAD-LEAF BEAKED-RUSH		E		G5	S1
RHYNCHOSPORA GLOBULARIS	COARSE GRASS-LIKE BEAKED-RUSH		E		G5?	S1
RHYNCHOSPORA GLOMERATA	CLUSTERED BEAKED-RUSH		E		G5T5?	SH
RHYNCHOSPORA INDEGATA	SLENDER HORNED-RUSH			LP	G3G4	S2
RHYNCHOSPORA NITENS	SHORT-BEAKED BALD-RUSH				G4?	S2
RHYNCHOSPORA VALLIDA	PALE BEAKED-RUSH				G3	S3
RHYNCHOSPORA VARIIFLORA	RARE-FLOWER BEAKED-RUSH		E		G5	S1
RHYNCHOSPORA SCIRPOIDES	LONG-BEAK BALD-RUSH				G4	S2
ROTMULA RANDESIOR	TOOTHLEAF				G5	S3
ROBUS LONGII	LONG'S BLACKBERRY				G4?Q	S1
RUELLIA CAROLINENSIS	CAROLINA PETUNIA		E		G5	SH
SACCIOLEPIS STRIATA	AMERICAN CUPSCALE		E		G5	SH
SAGITTARIA ANSTRALIS	SOUTHERN ARROWHEAD		E		G5	S1
SAGITTARIA TERRES	SLENDER ARROWHEAD		E		G3	S1
SCHIZAZA FUSILLA	CURLY GRASS PHEEN			LP	G3	S3
SCHWALBEA AMERICANA	CHAFFSEED		E		G2	S1
SCIRPUS LONGII	LONG'S WOOLGRASS		E	LP	G2	S2
SCLERIA VERTICILLATA	WHORLED NUT-RUSH		E		G5	S1
SCLEROLEPIS UNIFLORA	BOG BUTTONS		E	LP	G4	S2
SESUVIUM MARITIMUM	SEABEACH PURSLANE				G5	S2

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CAPE MAY COUNTY
BASE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

223 Records Processed

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	CRANK	SRANK
SOLIDAGO ELLIOTTII	ELLIOTT'S COLLEMBOD				05	63
SPHENOCLOIS PENNSYLVANICA	SWAMP ONTS				04	62
SPITANTHES LACINIATA	LACE-LIP LADIES'-TRESSES		E		0405	61
SPITANTHES OBOVATA	FRAGRANT LADIES'-TRESSES				05	62
SPITANTHES TUBEROSA	LITTLE LADIES'-TRESSES			LP	05	61
STYLOSANTHES BIFLORA	PENCIL-FLOWER				05	63
TITICULARIA DISCOLOR	GRANEFY ORCHID				0405	62
TRIDENM NALTREI	WALTER'S ST. JOHN'S-WORT		E		05	61
TRIDENS FLAVUS VAR. CHAPMANII	CHAPMAN'S HENTOP		E		0517	64
UTRICULARIA MINOR	LESSER BLADDERWORT		E		05	61
UTRICULARIA PUBESCENS	FUNNY BLADDERWORT			LP	05	63
UTRICULARIA RESUPINATA	REVERSED BLADDERWORT		E	LP	04	61
VALERIANELLA RADICATA	BEAKED CORNSALAD		E		05	61
VERBENA SIMPLEX	NARROW-LEAF VERVAIN		E		05	61
VIOLA BRITTONIANA VAR. BRITTONIANA	BRITTON'S COAST VIOLET				0405175	64
VOLPIA ELLIOTTA	SQUIRREL-TAIL SIX-WEEKS GRASS		E		05	61
XYSIS JUPICAI	RICHARD'S YELLOW EYED-GRASS				05	61

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APPENDIX C

TRACEN CAPE MAY NATURAL RESOURCES DATABASE

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TRACEN CAPE MAY NATURAL RESOURCES DATABASE

Most Federal environmental laws are implemented through a series of regulations that are frequently promulgated by the U.S. Environmental Protection Agency (EPA). Additional agencies such as the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS), regulate endangered species, and the Advisory Council on Historic Preservation (ACHP) and the National Park Service (NPS) regulate historic preservation. The Army Corps of Engineers (COE) regulates wetlands protection and mitigation. These regulations are then supplemented by Department of Transportation (DOT) and USCG instructions and policies for implementation by individual units. Many laws now waive Federal sovereign immunity and delegate implementation and enforcement authority to the states.

Most Federal environmental regulations are promulgated in response to legislation passed by the U.S. Congress. The principal environmental laws of the last two decades are listed in Table C1-1.

Table C1-1. Summary of Key Legislation Passed by Congress.

Legislation	Description
The American Indian Religious Freedom Act (AIRFA)	Directs Federal agencies to evaluate their policies and procedures in consultation with Native traditional religious leaders to determine changes necessary to protect and preserve Native American cultural and religious practices.
Archeological Resources and Protection Act (ARPA) of 1979	Requires a permit for any excavation or removal of archeological resources located on Federally-owned property and provides civil and criminal penalties for unauthorized removal, damage, or vandalism of archeological resources located on public lands. The land manager of the Federal property is responsible for issuing permits.
Clean Air Act (CAA) of 1970 and Clean Air Act Amendments (CAAA) of 1990 (also referred to as CAA90) -	Requires prevention, control, and abatement of air pollution from stationary and mobile sources. This Act also includes asbestos removal and disposal regulations and greatly reduces the use of ozone depleting substances.
Clean Water Act (CWA) of 1972, as amended through 1987	Regulates discharge of pollutants into waters of the U.S. from any point source including industrial facilities and sewage treatment facilities; regulates storm water runoff from certain industrial sources; requires reporting and cleanup of oil and hazardous substance spills in waterways; protects waterways; requires a permit to adversely affect wetlands; and requires spill prevention plans for sites that store petroleum products. Section 404 of the Clean Water Act requires a Corps of Engineers' permit before dredging or filling projects within wetlands. Under Section 401 of the Clean Water Act, a state may require that a water quality certification be obtained in addition to a Section 404 permit.
Coastal Barrier Resources Act	Prohibits new Federal expenditures or financial assistance for any purpose within the Coastal Barrier Resources System on or after October 18, 1982. Exemptions will be considered only after consultation with the Secretary of the Interior. USFWS guidelines defining new expenditures and financial assistance and describing procedures for consultation are found in 48 CFR 4866.

Legislation	Description
Superfund Amendments and Reauthorization Act (SARA) of 1986	Regulates cleanup of contaminated sites; CERCLA, also known as "Superfund", regulates releases of hazardous substances into the environment.
Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986	Requires units to provide local governments with information concerning possible chemical hazards in the community; requires emergency planning for releases of extremely hazardous substances.
Endangered Species Act (ESA) of 1973, as amended	Requires that Federal actions not jeopardize, threaten, destroy, or adversely impact the existence of threatened or endangered species or their habitats.
Energy Policy Act of 1992	Requires a 20 percent improvement in energy efficiency at Federal facilities, from Fiscal Year (FY) 85 through FY 2000, and minimization of the use of fossil fuels.
Federal Facilities Compliance Act	See Resource Conservation and Recovery Act of 1976.
Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) of 1972	Requires the licensing or registration of pesticide products; requires proper management of pesticide use, storage, and disposal.
Hazardous Materials Transportation Act (HMTA) of 1975	Authorized the Department of Transportation to issue interstate and intrastate regulations related to packing, repacking, handling, labeling, marking, placarding, and routing hazardous materials. In addition, HMTA established record keeping requirements and a registration program for shippers, carriers, and container manufacturers.
Marine Mammal Protection Act (MMPA) of 1972, as amended	Provides protection for marine mammals generally, and for species protected by the Endangered Species Act, (i.e., manatees, sea and marine otters, and dugongs). Responsible officials shall identify marine mammals and/or their habitats that may be affected by a Federal action. Any take of a marine mammal is prohibited without a permit from the National Marine Fisheries Service.
Migratory Bird Treaty Act (MBTA) of 1918	The domestic law that affirms, or implements, the United States' commitment to four international conventions with Canada, Japan, Mexico, and Russia for the protection of shared migratory bird resources. The MBTA governs the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts and nests. The take of all migratory birds is governed by the MBTA's regulation of taking migratory birds for educational, scientific, and recreational purposes and requiring harvest to be limited to levels that prevent overutilization. Section 704 of the MBTA states that the Secretary of the Interior is authorized and directed to determine if, and by what means, the take of migratory birds should be allowed and to adopt suitable regulations permitting and governing take. The MBTA prohibits the take, possession, import, export, transport, selling, purchase, barter, or offering for sale, purchase or barter, any migratory bird, their eggs, parts, and nests, except as authorized under a valid permit (50 CFR 21.11). Certain exceptions apply to employees of the Department of the Interior to enforce the MBTA and to employees of Federal agencies, State game departments, municipal game farms or parks, and public museums, public zoological parks, accredited institutional members of the American Association of Zoological Parks and Aquariums (now called the American Zoo and Aquarium Association) and public scientific or educational institutions.

Legislation	Description
National Environmental Policy Act (NEPA) of 1969	Mandates that Federal agencies “utilize a systematic, interdisciplinary approach to insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision making which may have an impact on man’s environment.” NEPA and its implementing regulations require that a certain level of environmental analysis and documentation be conducted for all Federal actions with the potential to significantly impact the environment. This documentation should be included in every recommendation or report on proposals for legislation.
National Historic Preservation Act (NHPA) of 1966	Requires Federal agencies to consider effects of their actions (i.e., construction, leasing, maintenance, and land transactions) on cultural and historic resources eligible for listing on the National Register of Historic Places.
Native American Graves Protection and Repatriation Act of 1990	Prohibits the intentional removal of Native American cultural items from Federal or tribal lands, except under an ARPA permit and in consultation with the appropriate Native American groups.
Noise Control Act of 1972	Establishes noise standards and regulates noise emissions from commercial products such as transportation and construction equipment.
Oil Pollution Act of 1990 (OPA)	Imposes requirements on the Federal government and industry to develop the capability and constant readiness to contain and remove oil spills of all sizes.
Resource Conservation and Recovery Act (RCRA) of 1976 as amended through 1984 by the Hazardous and Solid Waste Amendments (1984)	Establishes guidelines and standards for hazardous waste generation, transportation, treatment, storage, and disposal; requires management of underground storage tanks (USTs) and cleanup of hydrocarbon contamination. The Federal Facilities Compliance Act of 1992 requires inspection of Federal facilities for the treatment, storage, or disposal of hazardous waste.
Safe Drinking Water Act (SDWA) of 1974	Regulates drinking water quality with regard to pollutants that may have an adverse effect on human health or negatively affect the aesthetic quality of drinking water.
Toxic Substances Control Act (TSCA) of 1976	Regulates, among others, polychlorinated biphenyls (PCBs), radon, and asbestos; requires testing of chemical substances entering the environment, regulating releases where necessary

Executive Orders (EO) also affect the components of this INRMP. The EOs listed in Table C1-2 summarize the applicable EOs that relate to the content and implementation of this INRMP.

Table C1-2. Executive Orders Applicable to INRMP Implementation

Executive Order	Description
11593 - Protection and Enhancement of the Cultural Environment	This order requires that Federal agencies administer the cultural properties under their control in a spirit of stewardship and trusteeship for future generations. Agencies are to ensure the protection and enhancement of the cultural environment, including sites, structures, and objects of historical, architectural, and archaeological significance.

Executive Order	Description
11988 - Floodplain Management	The objective of this order is to avoid, to the extent possible, long- and short-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct and indirect support of floodplain development whenever there is a practicable alternative.
11990 - Protection of Wetlands	This EO furthers the purposes of the National Environmental Policy Act by directing Federal agencies to "...avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative..."
12088 - Federal Compliance with Pollution Control Standards	This EO is the critical link between Federal environmental regulations and Federal facilities. This order mandated that Federal facilities control and monitor environmental pollution in compliance with Federal environmental regulations, and established the A-106 reporting process. EPA has issued a document entitled "Federal Facilities Compliance Strategy" (November 1988), also known as the Yellow Book, which establishes a comprehensive and proactive approach by which Federal facilities may comply with these Federal regulations.
1211 - Environmental Effects Abroad of Major Federal Actions	This order addresses the environmental effects of major Federal actions abroad. The purpose of the Order is to establish internal procedures for Federal agencies to consider the significant effects of their actions on the environment outside the U.S. All interactions between Federal agencies and foreign governments are coordinated by the Department of State. The objectives of the order are to provide information to decisions-makers, to increase awareness of and interest in environmental concerns, and whenever possible, to encourage environmental cooperation with foreign nations.
12196 - Occupational Safety and Health Programs for Federal Employees	Executive Order 12196 requires Federal agencies to comply with Occupational Safety and Health Administration (OSHA) standards, inspect workplaces, resolve employee complaints, operate safety and health management information systems, and provide safety and health training.
12856 - Federal Compliance With Right-To-Know Laws and Pollution Prevention Requirements	This order requires Federal agencies to comply with pollution prevention, emergency planning, and reporting requirements of the Emergency Planning and Community Right-to-Know Act of 1986 and the Pollution Prevention Act of 1990.
1287 - Federal Acquisition, Recycling, and Waste Prevention	This order requires agencies to incorporate waste prevention and recycling in the agency's daily operations. Also requires the acquisition and use of "environmentally preferable products and services."
12898 - Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations	Executive Order 12898 directs Federal agencies to identify and address as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations.
12902 - Federal Energy Management	This order requires a 30 percent improvement in energy efficiency at Federal facilities from FY 85 to FY 2005.
13007 - Indian Sacred Sites	This order deals with "Indian sacred sites," which are physical places that may <i>or</i> may not be eligible for the National Register. Agencies are to seek ways to avoid physical damage to such sites, and avoid blocking access to them by Indian religious practitioners.

Executive Order	Description
13031 - Federal Alternative Fueled Vehicle Leadership	The purpose of this order is to ensure that the Federal Government exercise leadership in the use of alternative fueled vehicles (AFVs). This order requires 75 percent of all general-purpose vehicles acquired (additional or replacement vehicles) by Federal agencies be AFVs. These requirements apply to all agencies, regardless of whether they lease vehicles from the General Services Administration (GSA) or acquire them elsewhere. The goal is to promote the use of domestic and renewable fuels that produce less air pollution.
13084 - Consultation and Coordination with Indian Tribal Governments	Executive Order 13084 requires an agency to consult and coordinate with Indian tribal governments. Agencies are to be guided by principles of respect for Indian tribal self-government and sovereignty, for tribal treaty and other rights, and for responsibilities that arise from the unique legal relationship between the Federal Government and Indian tribal governments.
1310 - Greening the Government through Waste Prevention, Recycling, and Federal Acquisition	This order requires each Executive Agency to develop and implement affirmative procurement programs for all EPA-designated guideline items purchased by their agency.
13123 - Greening the Government through Efficient Energy Management	This order is designed to promote the leadership role of government in advancing environmental stewardship through directing agencies to pursue all energy efficiency, water conservation, and fuel-switching measures that are life-style cost effective.

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Table C-1-3. TRACEN Cape May Natural Resources Management Database

Documents are on file at the TRACEN Environmental Protection and Safety Section.

PLANS
Installation Master Plan
Pollution Prevention Plan
Spill Prevention, Control and Countermeasure Plan. Enclosure to TRACENCMINST 16455.1C
IRP Management Action Plan
Threatened and Endangered Species Management Plan, TRACENCMINST 16450
Wetland Delineation Report
Biological Resources Survey
Urban Tree Database
Hazardous Waste Management Plan
COMDTINSTs , COMDTPUBs, DOT ORDERS / FEDERAL, STATE, AND LOCAL REGULATIONS
COMDTINST 16004.1A
COMDTINST 16475.2A
COMDTINST 16478.5
COMDTINST 5090.A
COMDTINST M16475.1B
COMDTINST M5090.3 (ES
COMDTPUB 5090.1A
COMDTPUB P11300.3
DOT Order 5610.1C
Waterfront Development Law (N.J.S.A. 12:5-3)
New Jersey Permanent Statutes 13:1B-15.151
New Jersey Coastal Permit Program Rules (N.J.A.C. 7:7)
New Jersey Cleanup Responsibility Act
Flood Hazard Area Control Act (NJSA 58:16A-50 et seq. & NJAC 7:13)

COMDTINSTs , COMDTPUBs, DOT ORDERS / FEDERAL, STATE, AND LOCAL REGULATIONS (continued)
Endangered Species Act; 16 USC 1531 <i>et seq.</i>
Executive Order 11514, Protection and Enhancement of Environmental Quality
Executive Order 11988, Floodplains Management
Executive Order 11990, Wetlands Management
Federal Fish and Wildlife Permit for Migratory Bird Depredation
Federal Insecticide, Fungicide, and Rodenticide Act, as amended; 7 USC 136 <i>et seq.</i>
Federal Land Policy and Management Act; 43 USC 1701
Federal Noxious Weed Act; 7 USC 2809 <i>et seq.</i>
Fish and Wildlife Conservation Act; P.L. 96-366, 16 USC 2901
Fish and Wildlife Coordination Act; 16 USC 661 <i>et seq.</i>
Migratory Bird Conservation Act; PL 89-699, 16 USC 715
National Environmental Policy Act; 42 USC 4341
Soil and Water Conservation Act; P.L. 95-193, 16 USC 2001

APPENDIX C-1

COMPOSITE NATURAL RESOURCES CONSTRAINTS

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APPENDIX C-2

USGS QUADRANGLE MAPS TRACEN CAPE MAY, NEW JERSEY

Cape May, New Jersey

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APPENDIX D

SPECIES INFORMATION FOR TRACEN CAPE MAY

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APPENDIX D-1

TREE AND SHRUB SPECIES SUITABLE FOR LANDSCAPING AT TRACEN CAPE MAY

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Tree and Shrub Species Suitable for Landscaping at TRACEN Cape May

COMMON NAME	SCIENTIFIC NAME
American beautyberry	<i>Callicarpa americana</i>
American beech	<i>Fagus grandifolia</i>
American holly	<i>Ilex opaca</i>
American hornbeam	<i>Carpinus caroliniana</i>
Bailey's dewberry	<i>Rubus baileyi</i>
Black huckleberry	<i>Gaylussacia baccata</i>
Black locust	<i>Robinia pseudoacacia</i>
Blackgum	<i>Nyssa sylvatica</i>
Blackhaw	<i>Viburnum prunifolium</i>
Blackjack oak	<i>Quercus marilandica</i>
Bristly locust	<i>Robinia hispida</i>
Chestnut oak	<i>Quercus prinus</i>
Climbing rose	<i>Rosa setigera</i>
Coastal serviceberry	<i>Amelanchier obovalis</i>
Cockspur hawthorn	<i>Crataegus crus-galli</i>
Common evening-primrose	<i>Oenothera biennis</i>
Common persimmon	<i>Diospyros virginiana</i>
Deerberry	<i>Vaccinium stamineum</i>
Eastern white pine	<i>Pinus strobes</i>
Flowering dogwood	<i>Cornus florida</i>
Gray dogwood	<i>Cornus racemosa</i>
Highland doghobble	<i>Leucothoe catesbaei</i>
Inkberry	<i>Ilex glabra</i>
Jerusalem artichoke	<i>Helianthus tuberosus</i>
Mapleleaf viburnum	<i>Viburnum acerifolium</i>
Mountain laurel	<i>Kalmia latifolia</i>
Narrowleaf evening-primrose	<i>Oenothera fruticosa</i>
New Jersey tea	<i>Ceanothus americanus</i>
Northern red oak	<i>Quercus rubra</i>
Osage orange	<i>Maclura pomifera</i>
Pink azalea	<i>Rhododendron nudiflorum</i>
Pitch pine	<i>Pinus rigida</i>
Post oak	<i>Quercus stellata</i>
Purpleflowering raspberry	<i>Rubus odoratus</i>
Red buckeye	<i>Aesculus pavia</i>
Red pine	<i>Pinus resinosa</i>
Sand blackberry	<i>Rubus cuneifolius</i>
Sawtooth blackberry	<i>Rubus argutus</i>
Scarlet oak	<i>Quercus coccinea</i>
Shagbark hickory	<i>Carya ovata</i>
Sourwood	<i>Oxydendrum arboreum</i>
Southern red oak	<i>Quercus falcate</i>
Staghorn sumac	<i>Rhus typhina</i>
Strawberry bush	<i>Euonymus Americana</i>
Sugar maple	<i>Acer rubrum</i>
Swamp chestnut oak	<i>Quercus michauxii</i>

COMMON NAME	SCIENTIFIC NAME
Sweetgum	<i>Fagus grandifolia</i>
Virginia pine	<i>Pinus virginiana</i>
Virginia rose	<i>Rosa virginiana</i>
Washington hawthorn	<i>Crataegus phaenopyrum</i>
Water oak	<i>Quercus nigra</i>

Source: VegSpec 2002

Grass and Wildflower Species Suitable for Landscaping at TRACEN Cape May

COMMON NAME	SCIENTIFIC NAME
American pokeweed	<i>Phytolacca americana</i>
Beaked agrimony	<i>Agrimonia rostellata</i>
Big bluestem	<i>Andropogon gerardii</i>
Bitter panicgrass	<i>Panicum amarum</i>
Butterfly milkweed	<i>Asclepias tuberosa</i>
Canada wildrye	<i>Elymus Canadensis</i>
Deertongue	<i>Panicum clandestinum</i>
Field horsetail	<i>Equisetum arvense</i>
Field paspalum	<i>Paspalum leave</i>
Indian woodoats	<i>Chasmanthium latifolium</i>
Lanceleaf loosestrife	<i>Lysimachia lanceolata</i>
Late purple aster	<i>Symphyotrichum patens</i>
Little bluestem	<i>Schizachyrium scoparium</i>
Prairie wedgescale	<i>Sphenopholis obtusata</i>
Purpletop tridens	<i>Tridens flavus</i>
Slender woodoats	<i>Chasmanthium laxum</i>
Splitbeard bluestem	<i>Andropogon ternaries</i>
Switchgrass	<i>Panicum virgatum</i>
Tall hairy agrimony	<i>Agrimonia gryposepala</i>
Varioushair fescue	<i>Festuca heteromalla</i>
Western brackenfern	<i>Pteridium aquilinum</i>

Source: VegSpec 2002

APPENDIX D-2

SNAKES OF NEW JERSEY

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NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF FISH & WILDLIFE

ENDANGERED & NONGAME SPECIES PROGRAM

Robert McDowell, Director

Martin McHugh, Assistant Director

Lawrence J. Niles, Ph.D., Chief

FIELD GUIDE TO REPTILES AND AMPHIBIANS OF NEW JERSEY

PREPARED BY: JACKIE GESSNER & ERIC STILES

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PARTNERSHIPS FOR WILDLIFE



SNAKES OF NEW JERSEY

Northern Water Snake (*Nerodia sipedon sipedon*)

Identification: 24" - 42". Although commonly mistaken for a water moccasin, the Northern Water Snake is a nonvenomous species. Adult water snakes are highly melanistic, usually brown or black with the remnants of a banding pattern. This pattern is more evident in some specimens than others. Some adults have dark crossbands on the neck and forepart of the body. Young are brilliantly colored in bright reddish-brown bands. Half-moons or stippling may be present on belly. The water snake can exhibit a mean disposition and can inflict a painful, non-venomous bite if carelessly handled, as well as a pungent musk. Scales keeled; anal plate divided.

Where to find them: Northern Water Snakes prefer quiet waters, but can be found in just about any river, stream, pond, lake, swamp, marsh, or bog. They can be seen swimming and foraging as well as basking on land.

When to find them: Active May through October.

Range: Entire state.

Queen Snake (*Regina septemvittata*)

Identification: 15" - 24". The Queen Snake is an uncommon sight. It is a slender, brown aquatic snake with a yellow stripe along lower side of body. Its belly is yellow but marked with four distinct brown stripes, of which the outer two are larger. Although difficult to see, the Queen Snake also has three more narrow, dark stripes running down the length of its back. Scales keeled; anal plate divided.

Where to find them: Queen Snakes are typically found in small rivers and creeks, but can exist in a variety of other aquatic habitats as well. They dwell where crayfish are available and abundant. Queen Snakes are not usually conspicuous baskers, as water snakes are. They are more likely to be found beneath rocks or debris at the water's edge, or swimming.

When to find them: Active May through October.

Range: In a strip along the Delaware River, about 10 miles wide at the Burlington-Mercer County border. It narrows in the Northern Region through Mercer County to include the extreme southern tip of Hunterdon County. In the Southern Region, the range extends to northern Gloucester County riverbank.

Note: There have not been any recorded sightings of the Queen Snake in New Jersey since 1977.

Northern Brown (DeKay's) Snake (*Storeria dekayi dekayi*)

Identification: 9" - 13". The Northern Brown Snake has two parallel rows of blackish spots down the length of its back. A few of the spots may be linked with their partners across the back by narrow lines of dark pigment. The background color of the brown snake varies from light yellowish brown or gray to dark brown or deep reddish brown and its belly is pale yellowish, brownish, or pinkish. The belly remains unmarked except for one or more small black dots at the side of each ventral scale. Scales keeled and in 17 rows; anal plate divided.

Where to find them: Typically will turn up in parks, cemeteries, and beneath trash in empty lots, even in large urban centers, if pollution is not bad, but mainstay of habitat includes bogs, swamps, freshwater marshes, moist woods, and hillsides. The brown snake is not commonly seen because it is so adept at hiding. They are sometimes mistaken for a young garter snake.

When to find them: Active April through October.

Range: Entire state.

Northern Redbelly Snake (*Storeria occipitomaculata occipitomaculata*)

Identification: 8" - 10". The redbelly snake is typically identified by its plain red belly and three pale-colored nape spots. However, this pattern is highly variable. The nape spots are usually well defined. The back of the snake's body is usually a dull shade of brown with traces of four thin, dark stripes or a light middorsal stripe, or both. Many specimens can be gray and a few are even black. In rare cases, the belly of the redbelly snake may be blue-black. Scales keeled and in 15 rows; anal plate divided.

Where to find them: The Northern Redbelly Snake is quite secretive, but often found in or near wooded areas, as well as in or near sphagnum bogs.

When to find them: Active April through September.

Range: Entire state.

Eastern Garter Snake (*Thamnophis sirtalis sirtalis*)

Identification: 18" - 26". The Eastern Garter Snake usually has lateral stripes confined to rows of two and three, but this pattern is extremely variable, as is its coloration. Either stripes or a checkered pattern may run the length of its body. Normally, there are three yellowish stripes, but they may vary in color to greenish, brownish, or bluish. The background color of the garter snake varies from black to dark brown to green to olive. Usually, there is a double row of alternating black spots between the stripes. Its belly is greenish or yellowish, with two rows of indistinct black spots. Scales keeled; anal plate single.

Where to find them: A common snake in New Jersey that has a wide range of habitats including meadows, marshes, woodlands, hillsides, and along streams and drainage ditches. It can sometimes be found in city parks and cemeteries.

When to find them: Active April through September.

Range: Entire state.

Eastern Ribbon Snake (*Thamnophis sauritus sauritus*)

Identification: 18" - 26". Ribbon snakes are slim and slender snakes. The three bright stripes, normally yellow in color, are evident against the dark body and tail. The middorsal stripe sometimes has an orange or greenish tinge. Its belly is a plain yellowish or greenish color and its tail is exceptionally long, about 1/3 the total length of the snake. Scales keeled; anal plate single.

Where to find them: This vigorous, slender snake is semi-aquatic and is typically near streams, ponds, bogs, or swamps. If swimming, the ribbon snake stays at the surface instead of diving as water snakes do. If fleeing away, they will skirt the shore.

When to find them: Active April through September.

Range: Entire state.

Eastern Smooth Earth Snake (*Virginia valeriae valeriae*)

Identification: 7" - 10". A small gray or light brownish gray snake lacking any distinct markings. There may be an indication of a faint light stripe down the back. The Eastern Smooth Earth Snake appears ever so slightly keeled, with a light line running through each of its scales, but it is not. Sometimes there are tiny black spots on the back of the snake's body, which can be scattered or arranged in rows. The belly of this snake is plain white or yellowish. Scales smooth or weakly keeled (most keeled near tail) and in 15 rows; anal plate divided.

Where to find them: The smooth earth snake is adept at hiding, and although difficult to find, may be locally common in some areas. They are typically found in disturbed areas near deciduous forests, such as trails, back roads, and abandoned fields.

When to find them: Active April through September.

Range: Entire Southern Region. Monmouth, Middlesex, Mercer, Hudson, Essex, Union, Somerset, and southeastern Morris Counties in the Northern Region.

Eastern Hognose Snake (*Heterodon platyrhinos*)

Identification: 20" - 33". If nothing else, the tendency of the eastern hognose snake to play dead when threatened in any way is key to its identification. The hognose will hiss, spread its head and neck, turn its head upside-down, and stick out its tongue. The hognose snake gets its name from its upturned snout. The eastern hognose can vary in color from a highly melanistic, jet-black individual to one patterned with black blotches on a golden or gray body. The hognose is short in length, but wide in diameter. Its belly is mottled with gray or green on a yellow, light gray, or pinkish background. The underside of its tail is lighter than its belly - easily checked when snake is playing dead. Scales keeled; anal plate divided.

Where to find them: The eastern hognose snake is most often found in a variety of habitats with sandy substrate.

When to find them: April through September.

Range: Entire state.

Northern Ringneck Snake (*Diadophis punctatus edwardsi*)

Identification: 10" - 15". A smooth, dark, slender snake with a golden or orange collar. The back of the snake varies from black to slate to brown and its belly is a uniform shade of yellow. Occasionally, there is a row or partial row of small black dots down the center of its otherwise unmarked belly. Many people believe ringnecks are young racers. Scales smooth; anal plate divided.

Where to find them: Northern Ringneck Snakes are found in woodland areas, typically hiding beneath logs, bark slabs, stones and even trash. In particular, Northern Ringneck Snakes favor cutover wooded areas.

When to find them: Active April through September.

Range: Entire state.

Southern Ringneck Snake (*Diadophis punctatus punctatus*)

Identification: 10" - 14". A ringneck snake, very similar in appearance to the Northern Ringneck Snake, but with two exceptions. First, the Southern Ringneck Snake has a series of black markings, shaped like half-moons, running down the length of its yellow belly in a central row. Second, the neck ring on a Southern Ringneck Snake is normally interrupted by dark pigment. The snake varies in color from black to light brown. Scales smooth; anal plate divided.

Where to find them: Southern Ringneck Snakes are found in much of the same habitat as Northern Ringneck Snakes--near swamps, springs, and on damp wooded hillsides, usually under shelter like a fallen log or a slab of bark. They are most active at night.

When to find them: Active April through September.

Range: All of Southern Region. Southern Monmouth County in Northern Region.

Eastern Worm Snake (*Carphophis amoenus amoenus*)

Identification: 7 1/2" - 11". The Eastern Worm Snake looks very much like a large earthworm. The back of the snake is a dull brown and its belly and one or two adjacent rows of dorsal scales are pink. The Eastern Worm Snake's head is pointed. Scales smooth and opalescent; anal plate divided.

Where to find them: The Eastern Worm Snake is hard to come by as it is almost always hidden and virtually never out and about. It favors moist earth, and is typically found under boards and in rotting logs. The worm snake disappears deep underground in dry weather.

When to find them: Active April through September.

Range: Entire state.

Northern Black Racer (*Coluber constrictor constrictor*)

Identification: 36" - 60". The Northern Black Racer is an entirely black snake with a slender body. Its belly is slightly lighter than its back, usually with a bluish tinge. The iris of a racer's eye is brown or dark amber. The Northern Black Racer hunts with its head held a few inches off the ground. It will flee quickly if approached, with only a glimpse of its tail as it darts off. However, the black racer is also an aggressive snake that does not flee too far. If cornered, it will put up a fierce fight. Juvenile Northern Black Racers are highly patterned with a middorsal row of dark blotches on a gray background. As they grow, black racers lose the blotched pattern and become a uniform black snake. Scales smooth; anal plate divided.

Where to find them: Racers are quite common in fields and open woodlands, as well as occasionally being found in suburban areas.

When to find them: Active April through September.

Range: Entire state.

Rough Green Snake (*Opheodrys aestivus*)

Identification: 22" - 32". The Rough Green Snake is hard to find because of its cryptic coloration and shape. The Rough Green Snake is a small, green, slender snake that is plain light green above and plain white, yellow, or pale greenish below—making it easily mistaken for a vine. Scales keeled; anal plate divided.

Where to find them: Rough Green Snakes spend much of their time climbing, where they easily blend in with the shrubs and vines they are foraging in. Rough Green Snakes are frequently found amongst vegetation overhanging a stream or the edge of a lake.

When to find them: Active April through September.

Range: All of Southern Region. Extreme southern corners of Monmouth County in the Northern Region.

Smooth Green Snake (*Opheodrys vernalis*)

Identification: 11 7/8" - 20". The Smooth Green Snake looks very much like the Rough Green Snake. However, the Smooth Green Snake does not have keeled scales. It is a small snake that is bright green above with a plain white belly that is sometimes washed with pale yellow. Scales smooth; anal plate divided.

Where to find them: Smooth Green Snakes are found primarily in the grass and in other terrestrial habitats where they blend in quite easily.

When to find them: Active April through September.

Range: Northern Region: Sussex, Bergen, Passaic, Essex, Hudson, and northern Warren and Morris Counties.

Corn Snake (*Elaphe guttata guttata*) State Endangered Species

Identification: 30" - 48". The Corn Snake is also known as the "red rat snake". The Corn Snake is a boldly colored snake with red to orange blotches outlined in black on a variable background of gray, brown, or orange. Its belly is distinctly checkered with black and white and the underside of the tail is usually striped. The first blotch on the neck of the Corn Snake divides into two branches that extend forward and meet in a spearpoint between the eyes. Scales weakly keeled; anal plate divided.

Where to find them: The Corn Snake is very rare in New Jersey. It is typically found in sandy, forested areas, as in the New Jersey Pine Barrens. Corn Snakes utilize pine-oak forests with an understory of low brush. They can be found in hollow logs, railroad ties, and foundations of old buildings as well as under boards and logs.

When to find them: Active May through September. Mostly nocturnal, especially during the hot summer months.

Range: Southern Region: Ocean, Atlantic, southeastern Burlington, and northeastern Cumberland Counties.

Black Rat Snake (*Elaphe obsoleta obsoleta*)

Identification: 42" - 72". Like the Northern Black Racer, the Black Rat Snake is a plain, shiny black snake, but sometimes showing traces of a spotted pattern when the skin is distended. Some skin between scales may be white, but these areas are very tiny. Its belly is diffused or clouded with gray or brown on white or a shade of yellow. There is a distinct black and white checkered pattern on the throat of the Black Rat Snake. Juvenile Black Rat Snakes have a pattern of black blotches on a gray background. Scales weakly keeled; anal plate divided.

Where to find them: Black Rat Snakes are found in habitats very similar to that of the Northern Black Racer. They can be found in wooded hillsides and in flat farmlands. The Black Rat Snake is known to climb, and some even dwell in the holes of hollow trees.

When to find them: Active April through September.

Range: Entire state.

Northern Pine Snake (*Pituophis melanoleucus melanoleucus*) State Threatened Species

Identification: 48" - 66". The Northern Pine Snake has dark blotches, usually black or dark brown in color, on a white, gray, or cream colored background. The blotches may get lighter in color towards the tail. It also has a tendency to hiss when threatened or molested. Scales keeled; anal plate single.

Where to find them: The Northern Pine Snake is essentially limited to the sandy habitat of the New Jersey Pine Barrens. It is usually secretive and burrows quite often.

When to find them: Active April through October. Pine snakes can be found throughout the day, but usually in the morning and late afternoon during warm months.

Range: Locally in Southern Region: Ocean, Burlington, Atlantic, and Cape May Counties; eastern Cumberland, Gloucester, and Camden Counties; and southern Monmouth Counties.

Eastern Kingsnake (*Lampropeltis getula getula*)

Identification: 36" - 48". The Eastern Kingsnake is a shiny, black snake with distinct links of white or cream. The body is more black than white. Scales smooth; anal plate single.

Where to find them: The Eastern Kingsnake, while found in primarily terrestrial habitats, also favors the banks of streams and the borders of swamps. If necessary, an Eastern Kingsnake will swim to escape. Like most snakes, the Eastern Kingsnake is very secretive and is found under boards and logs.

When to find them: Active April through September.

Range: All of Southern Region except northern Burlington County, and southern Monmouth County in the Northern Region.

Eastern Milk Snake (*Lampropeltis triangulum triangulum*)

Identification: 24" - 36". The Eastern Milk Snake has brown or reddish-brown blotches outlined in black running down the length of its body, with the middorsal blotches being larger than the others. The milk snake USUALLY has a Y-shaped or V-shaped light patch on the nape of its neck, but this is not always the case. The background varies in color from gray to tan. There is a black and white checkered pattern on its belly. Scales smooth; anal plate single.

Where to find them: Milk snakes are found in fields, wooded areas, riverbanks, and rocky hillsides. It is not uncommon to find milk snakes in barns or other outbuildings, where they go in search of rodents.

When to find them: Active April through September.

Range: Entire state.

Scarlet Kingsnake (*Lampropeltis triangulum elapsoides*)

Identification: 14" -20". The Scarlet Kingsnake is very much a mimic of the venomous Eastern Coral Snake, but there are a few exceptions that help to identify it as a Scarlet Kingsnake. First, the snout is red, and second, the yellow rings are separated from the red by black. The rings on the Scarlet Kingsnake usually continue across its belly. Scales smooth, in 19 rows at mid-body; anal plate single.

Where to find them: Scarlet Kingsnakes are typically found in or near pine woods where they are hidden under bark and logs. They primarily come out only at night or following a heavy rain.

When to find them: Active April through September.

Range: All of Southern Region. In the Northern Region, southern Monmouth and Mercer Counties.

"Coastal Plain" Milk Snake intergrade (*L. t. triangulum* x *L. t. elapsoides*)

Identification: The milk snake intergrade is a vibrant snake that looks very much like its two counterparts. It has orange blotches outlined in black on a yellow background. There is typically no Y-shaped or V-shaped blotch on the nape of the neck as there usually is in the eastern milk snake. Because these intergrades are so rare, little is known and their patterns and coloration are considered highly variable.

Where to find them: The "Coastal Plain" Milk Snake is found in habitats similar to that of the Eastern Milk Snake and Scarlet Kingsnake, including woodlands, riverbanks, and outbuildings like barns.

When to find them: Active April through September.

Range: Where the populations of the Eastern Milk Snake and the Scarlet Kingsnake overlap, namely in the Southern region and in southern Monmouth and Mercer Counties in the Northern Region.

Northern Scarlet Snake (*Cemophora coccinea copei*)

Identification: 14" - 20". The Northern Scarlet Snake mimics the Eastern Coral Snake as well. Its belly is white. The red and yellow rings of the Northern Scarlet Snake are separated by black and the snout is red and pointed. The pattern is well defined in young snakes, but in adults, dark spots may appear in the red and especially the whitish areas. Scales smooth; anal plate single.

Where to find them: The Northern Scarlet Snake is found in soil that is suitable for burrowing as they are secretive reptiles. They are usually found under logs and slabs of bark and are rarely seen out above ground.

When to find them: Active April through September. Mostly nocturnal.

Range: Southern Region: all of Atlantic, southern Burlington and Ocean Counties. Locally in Cumberland, Camden, Gloucester, and Monmouth Counties.

Northern Copperhead (*Agkistrodon contortix mokasen*) (VENOMOUS)

Identification: 24" - 36". The copperhead, with its red-brown coloration and darker hourglass bands, is easily camouflaged in the leaf litter of a forest floor. Small, dark spots are frequently present between crossbands and dark, rounded spots can be seen at the sides of its belly. Scales weakly keeled; anal plate single.

Where to find them: Northern Copperheads favor rotting woodpiles in rocky, wooded areas that are usually mountainous. Copperheads will den with other species of snakes in the winter, particularly the timber rattlesnake.

When to find them: Active May through October.

Range: Rocky talus slopes and forest habitats in the Northern Region. These habitats are scattered throughout the Northern Region, but are primarily located in Sussex, Warren, Hunterdon, and Passaic Counties.

WARNING: Do NOT attempt to handle this snake!

Timber Rattlesnake (*Crotalus horridus*) State Endangered Species—(VENOMOUS)

Identification: 36" - 60". This is the only rattlesnake in New Jersey, and in most of the Northeast. There are 2 color variations in New Jersey: (1) yellow variation: black or dark brown crossbands on a ground color of yellow or brown, the crossbands may be V-shaped and break up into spots down its back; (2) black (melanistic) variation: a heavy stippling of black or very dark brown that hides much of the lighter pigment. It is not unusual to find a completely black individual. Scales keeled; anal plate single.

Where to find them: The Timber Rattlesnake has two distinct populations and habitat requirements in New Jersey, unrelated to their color variation. In northern New Jersey, Timber Rattlesnakes are found in rocky, wooded ledges where they den in south-facing slopes. In the Pine Barrens, the Timber Rattlesnakes have scattered populations in the swamps and pine-oak forests, where they den along riverbeds.

When to find them: Active May through October.

Range: Southern Region: inland Atlantic and Ocean Counties, southern Burlington, eastern Gloucester, and northeastern Cumberland Counties. Northern Region: western Passaic, northern Morris, western Warren and Sussex Counties.

WARNING: Do NOT attempt to handle this snake!

Northern Water Snake (*Nerodia sipedon sipedon*)



Queen Snake (*Regina septemvittata*)



Northern Brown (DeKay's) Snake (*Storeria dekayi dekayi*)



Northern Redbelly Snake (*Storeria occipitomaculata occipitomaculata*)



Eastern Garter Snake (*Thamnophis sirtalis sirtalis*)



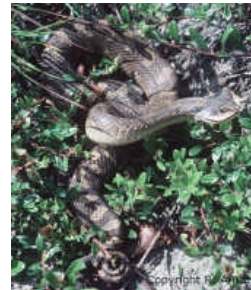
Eastern Ribbon Snake (*Thamnophis sauritus sauritus*)



Eastern Smooth Earth Snake (*Virginia valeriae valeriae*)



Eastern Hognose Snake (*Heterodon platyrhinos*)



Northern Ringneck Snake (*Diadophis punctatus edwardsi*)



Southern Ringneck Snake (*Diadophis punctatus punctatus*)



Eastern Worm Snake (*Carphophis amoenus amoenus*)



Northern Black Racer (*Coluber constrictor constrictor*)



Rough Green Snake (*Opheodrys aestivus*)



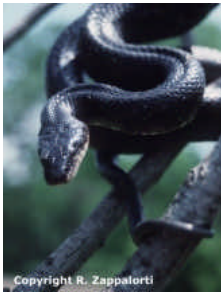
Smooth Green Snake (*Opheodrys vernalis*)



Corn Snake (*Elaphe guttata guttata*) State Endangered Species



Black Rat Snake (*Elaphe obsoleta obsoleta*)



Northern Pine Snake (*Pituophis melanoleucus melanoleucus*) State Threatened Species



Eastern Kingsnake (*Lampropeltis getula getula*)



Eastern Milk Snake (*Lampropeltis triangulum triangulum*)



Scarlet Kingsnake (*Lampropeltis triangulum elapsoides*)



"Coastal Plain" Milk Snake intergrade (*L. t. triangulum* x *L. t. elapsoides*)



Northern Scarlet Snake (*Cemophora coccinea copei*)



Northern Copperhead (*Agkistrodon contortix mokasen*) (VENOMOUS)



Timber Rattlesnake (*Crotalus horridus*) State Endangered Species—(VENOMOUS)



APPENDIX D-3

FROGS OF NEW JERSEY

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NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF FISH & WILDLIFE

ENDANGERED & NONGAME SPECIES PROGRAM

Robert McDowell, Director

Martin McHugh, Assistant Director

Lawrence J. Niles, Ph.D., Chief

FIELD GUIDE TO REPTILES AND AMPHIBIANS OF NEW JERSEY

PREPARED BY: JACKIE GESSNER & ERIC STILES

1ST EDITION, February 2001

FUNDED BY: CONSERVE WILDLIFE FUNDS AND U.S. FISH & WILDLIFE SERVICE'S
PARTNERSHIPS FOR WILDLIFE.



TOADS AND FROGS OF NEW JERSEY

Eastern Spadefoot (toad) (*Scaphiopus holbrookii holbrookii*)

Identification: 1 3/4" - 2 1/4". This toad is essentially some shade of brown, with two yellow lines running from each eye down the back. These two lines are usually quite obvious; however, some spadefoots are highly melanistic and the lines are very faint. Large yellow eyes with elliptical pupils protrude out of their heads. On each hind foot there is a sharp, black spade. The skin of the spadefoot is rather smooth for a toad, and the parotoid glands are absent or indistinguishable.

Where to find them: Spadefoots are found in sandy or loose soil habitats.

When to find them: Active April through September. However, spadefoots remain burrowed underground, sometimes for years, only to come to the surface after warm, heavy rains.

Voice: A short, low-pitched grunt, rather explosive. Some have compared it to the call of a young crow.

Range: Entire state.

American Toad (*Bufo americanus*)

Identification: 2" - 3 1/2". Though this toad is common in the Northern Region of the state, it is easily confused with the Fowler's Toad. However, the American Toad has four distinct features. First, they have only one or two large warts (bumps) in each of the largest dark blotches. Second, the chest is usually spotted with a darker color. Third, the warts on this toad's tibias are enlarged. Finally, the parotoid gland is either separated from the ridge behind the eye, or connected with it by a short spur. The warts of this toad can be yellow, orange, red, or brown and the blotches the warts are in are a deeper color of brown or black. The toad is basically brown, gray, olive, or brick red in color.

Where to find them: American Toads can be found anywhere from backyards to remote woodland areas. For breeding purposes, these toads require shallow bodies of water, like vernal ponds or the shallow edges of streams.

When to find them: Active March through late September. Breeds from March to June.

Voice: Long, musical trill. Often considered to be a pleasant sign of early spring. Calls can be as short as six seconds or as long as thirty seconds. About thirty or forty trills per second.

Range: All of Northern Region except southern Monmouth County.

Fowler's Toad (*Bufo woodhousii fowleri*)

Identification: 2" - 3". Four key characteristics of Fowler's Toads are: (1) three or more warts (bumps) in each of its dark blotches, (2) chest is essentially unmarked, (3) warts on tibia are not greatly enlarged, and (4) the parotoid gland usually does touch the cranial ridge behind the eye. Fowler's Toads are basically brown or gray, and usually have a light line running from between their eyes down the length of their backs.

Where to find them: The Fowler's Toad occurs mainly in sandy habitats throughout the state. They breed in vernal ponds, ditches, and the shallow edges of lakes and ponds.

When to find them: Active April through late September. Breeds from spring to mid-August, about the same time as the American Toad.

Voice: A nasal *w-a-a-a-h*, similar to the sound of a baby crying, that lasts for one to four seconds.

Range: Entire state.

Note: Fowler's Toad is known to hybridize with other species of toads. The offspring may show characteristics of both parents, and the calls of male hybrids may be intermediate and difficult or impossible to identify.

Treefrogs and their allies: Family characteristics include adhesive toe discs, and color changes in some species depending on light, moisture, temperature, stress, or breeding activity.

Northern Cricket Frog (*Acris crepitans crepitans*)

Identification: 5/8" - 1 3/8". Dark stripes run from the eyes of the Northern Cricket Frog down its back. It is generally brown on the sides, blending to more of a green hue on the back. A key characteristic is the dark triangle-shaped blotch between the eyes. The head is blunt and dark stripes are found on the thighs.

Where to find them: Cricket frogs are found near shallow areas of permanent bodies of water vegetated with shrubs and trees.

When to find them: Breeds April to June.

Voice: Sounds like two pebbles or metal balls being clicked together repeatedly—*gick, gick, gick, gick*. The call is slow at first, but picks up speed and lasts as long as twenty to thirty beats.

Range: Entire state.

Pine Barrens Treefrog (*Hyla andersonii*) State Endangered Species

Identification: 1 1/8" - 1 3/4". This vibrant frog is easy to identify with its lavender stripes outlined in white against the bright green ground color of its body. The concealed surfaces of its legs are bright orange.

Where to find them: The Pine Barrens Treefrog requires the acidic waters of Atlantic white-cedar swamps and bogs in the New Jersey Pine Barrens. They will typically call from trees standing in or near water, and will return to a more terrestrial habitat after breeding. Essentially only seen by following the calling male to its location.

When to find them: Can be found by their breeding calls in May, June, and July. Breeds in late spring and early summer.

Voice: Like the sound of a horn honking—*quonk, quonk, quonk, quonk*. Call is slower in cooler weather.

Range: Burlington, Ocean, Atlantic, Camden, and Gloucester Counties in the Southern Region: primarily restricted to Pine Barrens.

Northern Gray Treefrog (*Hyla versicolor*) and Southern (Cope's) Gray Treefrog (*Hyla chrysoscelis*) Southern Gray Treefrog is a State Endangered Species

Identification: 1 1/4" - 2". These two species are identical with the exception of their calls. They are both moderately large in comparison with most other members of the treefrog family. These treefrogs are typically gray, with some individuals having some green or brown in them. Their skin is warty (for a treefrog) and the concealed parts of their legs are bright orange or golden yellow.

Where to find them: Gray treefrogs are typically high in the trees, except when they are at the water's edge during breeding season. Highly camouflaged on the bark of tree trunks, the gray treefrogs are often only seen when their call gives them away. They breed in gravel pit ponds or swamps, and remain in mixed forest uplands during the rest of the year. Gray treefrogs call from the ground and from the treetops.

When to find them: Breed from May through July. High humidity and temperatures above 17° C initiate breeding activity.

Voice: The Northern Gray Treefrog has a slow trill while that of the Southern Gray Treefrog is quicker, shorter, and higher-pitched. Because it is sometimes hard to distinguish between the two where their ranges overlap, a tape recording of the call along with the temperature and humidity will aid in identification. The speed of the trills in both species is slowed when the weather is cool.

Range: Northern Gray Treefrog: Entire state.

Southern (Cope's) Gray Treefrog: Cape May and southern Cumberland, Ocean, and Atlantic Counties in the Southern Region.

Northern Spring Peeper (*Pseudacris crucifer crucifer*)

Identification: 3/4" - 1 1/4". Spring Peepers are marked by an imperfect, dark-colored "x" on their backs. Peepers can be olive, brown, gray, yellow, or any shade in between. This particular subspecies has a plain or virtually plain belly.

Where to find them: Spring Peepers tend to congregate where trees and shrubs are standing in water. This woodland species is often found near swamps and vernal ponds, as well as in cutover woods.

When to find them: Breeds from early March through May. Occasionally heard through August depending on weather.

Voice: *Peep, peep, peep, peep*—the call sounds like a high-pitched whistle. The single note repeated in well-defined intervals can be deafening when there is a full chorus of hundreds of individuals.

Range: Entire state.

Upland Chorus Frog (*Pseudacris triseriata feriarum*)

Identification: 3/4" - 1 3/8". The basic color of this chorus frog varies from brown to gray, but three characteristics remain constant. First, there is a light line through the upper lip. Second, a dark stripe from snout to groin passes through the eye. Third, there are three dark stripes or rows of small spots down its back. A dark triangle between the eyes (or a suggestion of one) is usually present. There are usually dark flecks on its otherwise cream-colored breast.

Where to find them: Swamps, moist woodlands, and the surroundings of marshes, bogs, and ponds are suitable habitats for the Upland Chorus Frog.

When to find them: Breeds from February to May.

Voice: Regularly repeated creaking sound—*crreek* or *prreep*.

Range: Northern Region: Sussex, Warren, Hunterdon, Morris, northwestern Bergen, and western Somerset and Passaic Counties.

New Jersey Chorus Frog (*Pseudacris triseriata kalmi*)

Identification: 3/4" - 1 1/2". The middle stripe of three dark stripes running down the back of the New Jersey Chorus Frog typically forks into two. Like the Upland Chorus Frog, a dark triangle or other dark figure may be present between the eyes and there is always a light line along the upper lip. These chorus frogs are pale gray to dark brown in color, with their markings always darker. Its belly is white and usually very plain, with only some individuals having a few dark spots.

Where to find them: This chorus frog is found in a variety of habitats, including dry areas or those disturbed by human activity.

When to find them: Breeds from February to June.

Voice: Sounds like someone running their fingers over the teeth of a comb—*crreek* or *prreep*.

Range: All of Southern Region.

True Frogs: Family characteristics include long legs, narrow waists, and rather smooth skins. Fingers free and toes joined by webs. Check for the presence or absence of dorsolateral ridges, which are raised longitudinal folds of glandular tissues.

Bullfrog (*Rana catesbeiana*)

Identification: 3 1/2" - 6". The Bullfrog is by far the largest frog, marked by a netlike pattern of gray or brown on an overall green background. Underneath is usually whitish, with males often having a yellow wash. There are no dorsolateral ridges on the trunk of the body; they end near the eardrum.

Where to find them: Bullfrogs are found in permanent, fish-inhabited bodies of water, unlike most other frogs. Lakes, bogs, ponds, and slower portions of streams are common Bullfrog habitats. They are usually found amidst the vegetation at the water's edge.

When to find them: Breeds late April through July.

Voice: Bellowing *jug-o-rum*.

Range: Entire state.

Carpenter Frog (*Rana virgatipes*)

Identification: 1 5/8" - 2 5/8". The Carpenter Frog is easily identified by its four light stripes and the lack of dorsolateral ridges.

Where to find them: The Carpenter Frog is sometimes called the "sphagnum frog" because of its close association with sphagnum bogs. It has a tolerance for acidic waters, and is often found in the emergent vegetation of standing waters. When approached, the head vanishes downward but may reappear seconds later, a few feet away.

When to find them: Breeds April to August.

Voice: Sounds like carpenters hitting nails with hammers—*pu-tunk'*, *pu-tunk'*, *pu-tunk'*.

Range: All of Southern Region, except northern Salem, and western Camden and Gloucester Counties and the Cape May peninsula. Northern Region: southeastern Monmouth County.

Green Frog (*Rana clamitans melanota*)

Identification: 2 1/4" - 3 1/2". Despite its name, the Green Frog can actually be more brown than green in color. Dark brown or grayish blotches are usually present on the back, and the belly is generally white, but usually with some dark spots or mottling under legs and head. Adult males have bright, yellow throats. The dorsolateral ridges end on the Green Frog's body, and do not reach the groin. The center of the tympanum is elevated.

Where to find them: Green Frogs are found in any body of freshwater.

When to find them: Breeds April through August.

Voice: Sounds like a loose banjo string, with each note becoming less and less loud. The young Green Frogs issue an alarm call when frightened—a high-pitched peep—as they jump into the water.

Range: Entire state.

Wood Frog (*Rana sylvatica*)

Identification: 1 3/8" - 2 3/4". The Wood Frog looks as though it is wearing a robber's mask because of the dark patch extending backward from the eye. This characteristic is its key identifying mark. The Wood Frog can be so dark that it is almost black, or varies in color from pink shades to darker shades of brown.

Where to find them: Although the Wood Frog often wanders considerable distances from water, it is typically found in moist, wooded areas.

When to find them: An early breeder, March through May.

Voice: Sounds somewhat like the quack of a duck, but with little carrying power.

Range: Entire state.

Southern Leopard Frog (*Rana utricularia*)

Identification: 2" - 3 1/2". The Southern Leopard Frog can be brilliant green or rich brown with two or three rows of dark, round spots down its back. The dorsolateral ridges are marked with a normally yellow coloration. The sides of the body typically have fewer spots than the back. There is usually a distinct light spot the center of the tympanum, and a light line along its upper jaw.

Where to find them: The Southern Leopard Frog is usually found in shallow freshwater, but will even venture into brackish water near the coast. In the summer, they are often found in the shade of nearby grasses and other vegetation

When to find them: Breeds late April through June.

Voice: Sounds like a chuckle, with a guttural trill.

Range: Entire state.

Pickerel Frog (*Rana palustris*)

Identification: 1 2/4" - 3". Two rows of imperfect dark squares run down the back of the Pickerel Frog. These dark markings and similar ones on the sides are uneven, but are definitely not circular as in the Southern Leopard Frog. The concealed surfaces of the hind legs are bright orange or yellow.

Where to find them: Pickerel Frogs are found in a variety of habitats, particularly the clear waters of ravines and meadow streams. In the Coastal Plain, the Pickerel Frog is found in brown, turbid waters. In the summer, they wander well away from water and into vegetation. Males will often call while completely submerged underwater.

When to find them: Breeds March to May.

Voice: Sounds like a snore--low-pitched and with a short duration.

Range: Entire state.

Eastern Spadefoot (toad) (*Scaphiopus holbrookii holbrookii*)



American Toad (*Bufo americanus*)



Fowler's Toad (*Bufo woodhousii fowleri*)



Northern Cricket Frog (*Acris crepitans crepitans*)



Pine Barrens Treefrog (*Hyla andersonii*) (State Endangered Species)



Northern Gray Treefrog
(*Hyla versicolor*)



Southern (Cope's) Gray Treefrog
(*Hyla chrysoscelis*) State Endangered



Note: Gray Treefrogs are identical in physical appearance.

Northern Spring Peeper (*Pseudacris crucifer crucifer*)



Upland Chorus Frog
(*Pseudacris triseriata feriarum*)



New Jersey Chorus Frog
(*Pseudacris triseriata kalmi*)



Bullfrog (*Rana catesbeiana*)



Carpenter Frog (*Rana virgatipes*)



Green Frog (*Rana clamitans melanota*)



Wood Frog (*Rana sylvatica*)



Southern Leopard Frog (*Rana utricularia*)



Pickerel Frog (*Rana palustris*)



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APPENDIX D-4

PIPING PLOVER MANAGEMENT GUIDELINES FROM FWS

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

300 Westgate Center Drive

Hadley, MA 01035-9589



In Reply Refer To:
FWS/Region 5/ES-TE

APR 21 1994

Mr. John H. Spencer
Bureau of Natural Resources
Department of Environmental Protection
79 Elm Street
Hartford, Connecticut 06106-5127

Dear Mr. Spencer:

Enclosed are the U.S. Fish and Wildlife Service's Guidelines for Managing Recreational Activities in Piping Plover Breeding Habitat on the U.S. Atlantic Coast to Avoid Take Under Section 9 of the Endangered Species Act. This is the final version of the draft guidelines sent to you for review and comment on March 18, 1994.

These guidelines, based on the best available biological information, provide a flexible approach to protecting piping plovers, while minimizing impacts on beach recreation on non-Federal lands. Management techniques recommended in these guidelines will generally facilitate pedestrian access to the shoreline throughout the plover's breeding cycle. Recommended management options that include intensive monitoring will, in most cases, also allow use of motorized vehicles except when flightless chicks are present.

Please contact Anne Hecht at 508-443-4325 or Paul Nickerson at 413-253-8615 if you have questions about these guidelines or other aspects of the piping plover recovery effort.

Sincerely,

Regional Director

GUIDELINES FOR MANAGING RECREATIONAL ACTIVITIES
IN PIPING PLOVER BREEDING
HABITAT ON THE U.S. ATLANTIC COAST TO AVOID TAKE UNDER SECTION 9 OF
THE ENDANGERED SPECIES ACT

Northeast Region, U.S. Fish and Wildlife Service
April 15, 1994

The following information is provided as guidance to beach managers and property owners seeking to avoid potential violations of Section 9 of the Endangered Species Act (16 U.S.C. 1538) and its implementing regulations (50 CFR Part 17) that could occur as the result of recreational activities on beaches used by breeding piping plovers along the Atlantic Coast. These guidelines were developed by the Northeast Region, U.S. Fish and Wildlife Service (Service), with assistance from the U.S. Atlantic Coast Piping Plover Recovery Team. The guidelines are advisory, and failure to implement them does not, of itself, constitute a violation of the law. Rather, they represent the Service's best professional advice to beach managers and landowners regarding the management options that will prevent direct mortality, harm, or harassment of piping plovers and their eggs due to recreational activities.

Some land managers have endangered species protection obligations under Section 7 of the Endangered Species Act (see section I below) or under Executive Orders 11644 and 11989¹ that go beyond adherence to these guidelines. Nothing in this document should be construed as lack of endorsement of additional piping plover protection measures implemented by these land managers or those who are voluntarily undertaking stronger plover protection measures.

This document contains four sections: (I) a brief synopsis of the legal requirements that afford protection to nesting piping plovers; (II) a brief summary of the life history of piping plovers and potential threats due to recreational activities during the breeding cycle; (III) guidelines for protecting piping plovers from recreational activities on Atlantic Coast beaches; and (IV) literature cited.

¹ Executive Order 11644, Use of Off-Road Vehicles on the Public Lands and Executive Order 11989, Off-Road Vehicles on Public Lands pertain to lands under custody of the Secretaries of Agriculture, Defense, and Interior (except for Indian lands) and certain lands under the custody of the Tennessee Valley Authority.

I. LEGAL CONSIDERATIONS

Section 9 of the Endangered Species Act (ESA) prohibits any person subject to the jurisdiction of the United States from harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting listed wildlife species. It is also unlawful to attempt such acts, solicit another to commit such acts, or cause such acts to be committed. A "person" is defined in Section 3 to mean "an individual, corporation, partnership, trust, association, or any other private entity; or any officer, employee, agent, department, or instrumentality of the Federal Government, of any State, municipality, or political subdivision of a State, or of any foreign government; any State, municipality, or political subdivision of a State; or any other entity subject to the jurisdiction of the United States." Regulations implementing the ESA (50 CFR 17.3) further define "harm" to include significant habitat modification or degradation that results in the killing or injury of wildlife by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering. "Harass" means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Penalties for violation of Section 9 are provided in Section 11 of the ESA; for threatened species, these penalties include fines of up to \$25,000, imprisonment for not more than six months, or both.

Section 10 of the ESA and related regulations provide for permits that may be granted to authorize acts prohibited under Section 9, for scientific purposes or to enhance the propagation or survival of a listed species. States that have Cooperative Agreements under Section 6 of the ESA, may provide written authorization for take that occurs in the course of implementing conservation programs. For example, State agencies have authorized certain biologists to construct predator exclosures for piping plovers. It is also legal for employees or designated agents of certain Federal or State agencies to take listed species without a permit, if the action is necessary to aid sick, injured, or orphaned animals or to salvage or dispose of a dead specimen.

Section 10 also allows permits to be issued for take that is "incidental to, and not the purpose of, carrying out an otherwise lawful activity" if the Service determines that certain conditions have been met. An applicant for an incidental take permit must prepare a conservation plan that specifies the impacts of the take, steps the applicant will take to minimize and mitigate the impacts, funding that will be available to implement these steps, alternative actions to the take that the applicant considered, and the reasons why such alternatives are not being utilized.

Section 7 of the ESA may be pertinent to beach managers and landowners in situations that have a Federal nexus. Section 7 requires Federal agencies to consult with the Service (or National Marine Fisheries Service for marine species) prior to authorizing, funding, or carrying out activities that may affect listed species. Section 7 also requires that these agencies use their authorities to further the conservation of listed species. Section 7 obligations have caused Federal land management agencies to implement piping plover protection measures that go beyond those required to avoid take, for example by conducting research on threats to piping plovers. Other examples of Federal activities that may affect piping plovers along the Atlantic Coast, thereby triggering Section 7 consultation, include permits for beach nourishment or disposal of dredged material (U.S. Army Corps of Engineers) and funding of beach restoration projects (Federal Emergency Management Authority).

Piping plovers, as well as other migratory birds such as least terns, common terns, American oystercatchers, laughing gulls, herring gulls, and great black-backed gulls, their nests, and eggs are also protected under the Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-712). Prohibited acts include pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or attempting such conduct. Violators may be fined up to \$5000 and/or imprisoned for up to six months.

Almost all States within the breeding range of the Atlantic Coast piping plover population list the species as State threatened or endangered (Northeast Nongame Technical Committee 1993). Various laws and regulations may protect State-listed species from take, but the Service has not ascertained the adequacy of the guidelines presented in this document to meet the requirements of any State law.

II. LIFE HISTORY AND THREATS FROM HUMAN DISTURBANCE

Piping plovers are small, sand-colored shorebirds that nest on sandy, coastal beaches from South Carolina to Newfoundland. Since 1986, the Atlantic Coast population has been protected as a threatened species under provisions of the U.S. Endangered Species Act of 1973 (U.S. Fish and Wildlife Service 1985). The U.S. portion of the population was estimated at 875 pairs in 1993 (U.S. Fish and Wildlife Service 1993). Many characteristics of piping plovers contribute to their susceptibility to take due to human beach activities.

LIFE HISTORY

Piping plovers begin returning to their Atlantic Coast nesting beaches in mid-March (Coutu et al. 1990, Cross 1990, Goldin 1990, MacIvor 1990, Hake 1993). Males establish and defend territories and court females (Cairns 1982). Eggs may be present on the beach from mid-April through late July. Clutch size is generally four eggs, and the incubation period² usually lasts for 27-28 days. Piping plovers fledge only a single brood per season, but may renest several times if previous nests are lost. Chicks are precocial³ (Wilcox 1959, Cairns 1982). They may move hundreds of yards from the nest site during their first week of life (see Table 1, Summary of Chick Mobility Data). Chicks remain together with one or both parents until they fledge (are able to fly) at 25 to 35 days of age. Depending on date of hatching, flightless chicks may be present from mid-May until late August, although most fledge by the end of July (Patterson 1988, Goldin 1990, MacIvor 1990, Howard et al. 1993).

Piping plover nests are situated above the high tide line on coastal beaches, sand flats at the ends of sandspits and barrier islands, gently sloping foredunes, blowout areas behind primary dunes, and washover areas cut into or between dunes. They may also nest on areas where suitable dredge material has been deposited. Nest sites are shallow scraped depressions in substrates ranging from fine grained sand to mixtures of sand and pebbles, shells or cobble (Bent 1929, Burger 1987a, Cairns 1982, Patterson 1988, Flemming et al. 1990, MacIvor 1990,

² "Incubation" refers to adult birds sitting on eggs, to maintain them at a favorable temperature for embryo development.

³ "Precocial" birds are mobile and capable of foraging for themselves within several hours of hatching.

Strauss 1990). Nests are usually found in areas with little or no vegetation although, on occasion, piping plovers will nest under stands of American beachgrass (*Ammophila breviligulata*) or other vegetation (Patterson 1988, Flemming et al. 1990, MacIvor 1990). Plover nests may be very difficult to detect, especially during the 6-7 day egg-laying phase when the birds generally do not incubate (Goldin 1994).

Plover foods consist of invertebrates such as marine worms, fly larvae, beetles, crustaceans or mollusks (Bent 1929, Cairns 1977, Nicholls 1989). Feeding areas include intertidal portions of ocean beaches, washover areas, mudflats, sandflats, wrack lines⁴, and shorelines of coastal ponds, lagoons or salt marshes (Gibbs 1986, Coutu et al. 1990, Hoopes et al. 1992, Loegering 1992, Goldin 1993). Studies have shown that the relative importance of various feeding habitat types may vary by site (Gibbs 1986, Coutu et al. 1990, McConnaughey et al. 1990, Loegering 1992, Goldin 1993, Hoopes 1993) and by stage in the breeding cycle (Cross 1990). Adults and chicks on a given site may use different feeding habitats in varying proportion (Goldin et al. 1990). Feeding activities of chicks may be particularly important to their survival. Cairns (1977) found that piping plover chicks typically tripled their weight during the first two weeks post-hatching; chicks that failed to achieve at least 60% of this weight gain by day 12 were unlikely to survive. During courtship, nesting, and brood rearing, feeding territories are generally contiguous to nesting territories (Cairns 1977), although instances where brood-rearing areas are widely separated from nesting territories are not uncommon (see Table 1). Feeding activities of both adults and chicks may occur during all hours of the day and night (Burger 1993) and at all stages in the tidal cycle (Goldin 1993, Hoopes 1993).

THREATS FROM NONMOTORIZED BEACH ACTIVITIES

Sandy beaches that provide nesting habitat for piping plovers are also attractive recreational habitats for people and their pets. Nonmotorized recreational activities can be a source of both direct mortality and harassment of piping plovers. Pedestrians on beaches may crush

⁴ Wrack is organic material including seaweed, seashells, driftwood and other materials deposited on beaches by tidal action.

eggs (Burger 1987b, Hill 1988, Shaffer and Laporte 1992, Cape Cod National Seashore 1993, Collazo et al. 1994). Unleashed dogs may chase plovers (McConnaughey et al. 1990), destroy nests (Hoopes et al. 1992), and kill chicks (Cairns and McLaren 1980).

Pedestrians may flush incubating plovers from nests (see Table 2, Summary of Data on Distances at Which Plovers React to Disturbance), exposing eggs to avian predators or causing excessive cooling or heating of eggs. Repeated exposure of shorebird eggs on hot days may cause overheating, killing the embryos (Bergstrom 1991). Excessive cooling may kill embryos or retard their development, delaying hatching dates (Welty 1982). Pedestrians can also displace unfledged chicks (Strauss 1990, Burger 1991, Hoopes et al. 1992, Loegering 1992, Goldin 1993). Fireworks are highly disturbing to piping plovers (Howard et al. 1993). Plovers are particularly intolerant of kites, compared with pedestrians, dogs, and vehicles; biologists believe this may be because plovers perceive kites as potential avian predators (Hoopes et al. 1992).

THREATS FROM MOTOR VEHICLES

Unrestricted use of motorized vehicles on beaches is a serious threat to piping plovers and their habitats. Vehicles can crush eggs (Wilcox 1959; Tull 1984; Burger 1987b; Patterson et al. 1991; *United States of America v. Breezy Point Cooperative, Inc.*, U.S. District Court, Eastern District of New York, Civil Action No. CV-90-2542, 1991; Shaffer and Laporte 1992), adults, and chicks. In Massachusetts and New York, biologists documented 14 incidents in which 18 chicks and 2 adults were killed by vehicles between 1989 and 1993 (Melvin et al. 1994). Goldin (1993) compiled records of 34 chick mortalities (30 on the Atlantic Coast and 4 on the Northern Great Plains) due to vehicles. Many biologists that monitor and manage piping plovers believe that many more chicks are killed by vehicles than are found and reported (Melvin et al. 1994). Beaches used by vehicles during nesting and brood-rearing periods generally have fewer breeding plovers than available nesting and feeding habitat can support. In contrast, plover abundance and productivity has increased on beaches where vehicle restrictions during chick-rearing periods have been combined with protection of nests from predators (Goldin 1993; S. Melvin, pers. comm., 1993).

Typical behaviors of piping plover chicks increase their vulnerability to vehicles. Chicks frequently move between the upper berm or foredune and feeding habitats in the wrack line

and intertidal zone. These movements place chicks in the paths of vehicles driving along the berm or through the intertidal zone. Chicks stand in, walk, and run along tire ruts, and sometimes have difficulty crossing deep ruts or climbing out of them (Eddings et al. 1990, Strauss 1990, Howard et al. 1993). Chicks sometimes stand motionless or crouch as vehicles pass by, or do not move quickly enough to get out of the way (Tull 1984, Hoopes et al. 1992, Goldin 1993). Wire fencing placed around nests to deter predators (Rimmer and Deblinger 1990, Melvin et al. 1992) is ineffective in protecting chicks from vehicles because chicks typically leave the nest within a day after hatching and move extensively along the beach to feed (see Table 1).

Vehicles may also significantly degrade piping plover habitat or disrupt normal behavior patterns. They may harm or harass plovers by crushing wrack into the sand and making it unavailable as cover or a foraging substrate, by creating ruts that may trap or impede movements of chicks, and by preventing plovers from using habitat that is otherwise suitable (MacIvor 1990, Strauss 1990, Hoopes et al. 1992, Goldin 1993).

III. GUIDELINES FOR PROTECTING PIPING PLOVERS FROM RECREATIONAL DISTURBANCE

The Service recommends the following protection measures to prevent direct mortality or harassment of piping plovers, their eggs, and chicks.

MANAGEMENT OF NONMOTORIZED RECREATIONAL USES

On beaches where pedestrians, joggers, sun-bathers, picnickers, fishermen, boaters, horseback riders, or other recreational users are present in numbers that could harm or disturb incubating plovers, their eggs, or chicks, areas of at least 50 meter-radius around nests above the high tide line should be delineated with warning signs and symbolic fencing⁵. Only persons engaged in rare species monitoring, management, or research activities should enter posted areas. These areas should remain fenced as long as viable eggs or unfledged chicks are present. Fencing is intended to prevent accidental crushing of nests and repeated flushing of

⁵ "Symbolic fencing" refers to one or two strands of light-weight string, tied between posts to delineate areas where pedestrians and vehicles should not enter.

incubating adults, and to provide an area where chicks can rest and seek shelter when large numbers of people are on the beach.

Available data indicate that a 50 meter buffer distance around nests will be adequate to prevent harassment of the majority of incubating piping plovers. However, fencing around nests should be expanded in cases where the standard 50 meter-radius is inadequate to protect incubating adults or unfledged chicks from harm or disturbance. Data from various sites distributed across the plover's Atlantic Coast range indicates that larger buffers may be needed in some locations (see Table 2). This may include situations where plovers are especially intolerant of human presence, or where a 50 meter-radius area provides insufficient escape cover or alternative foraging opportunities for plover chicks.⁶

In cases where the nest is located less than 50 meters above the high tide line, fencing should be situated at the high tide line, and a qualified biologist should monitor responses of the birds to passersby, documenting his/her observations in clearly recorded field notes. Providing that birds are not exhibiting signs of disturbance, this smaller buffer may be maintained in such cases.

On portions of beaches that receive heavy human use, areas where territorial plovers are observed should be symbolically fenced to prevent disruption of territorial displays and courtship. Since nests can be difficult to locate, especially during egg-laying, this will also prevent accidental crushing of undetected nests. If nests are discovered outside fenced areas, fencing should be extended to create a sufficient buffer to prevent disturbance to incubating adults, eggs, or unfledged chicks.

⁶ For example, on the basis of data from an intensive three year study that showed that plovers on Assateague Island in Maryland flush from nests at greater distances than those elsewhere (Loefering 1992), the Assateague Island National Seashore established 200 meter buffers zones around most nest sites and primary foraging areas (Assateague Island National Seashore 1993). Following a precipitous drop in numbers of nesting plover pairs in Delaware in the late 1980's, that State adopted a Piping Plover Management Plan that provided 100 yard buffers around nests on State park lands and included intertidal areas (Delaware Department of Natural Resources and Environmental Control 1990).

Pets should be leashed and under control of their owners at all times from April 1 to August 31 on beaches where piping plovers are present or have traditionally nested. Pets should be prohibited on these beaches from April 1 through August 31 if, based on observations and experience, pet owners fail to keep pets leashed and under control.

Kite flying should be prohibited within 200 meters of nesting or territorial adult or unfledged juvenile piping plovers between April 1 and August 31.

Fireworks should be prohibited on beaches where plovers nest from April 1 until all chicks are fledged.

MOTOR VEHICLE MANAGEMENT

The Service recommends the following minimum protection measures to prevent direct mortality or harassment of piping plovers, their eggs, and chicks on beaches where vehicles are permitted. Since restrictions to protect unfledged chicks often impede vehicle access along a barrier spit, a number of management options affecting the timing and size of vehicle closures are presented here. Some of these options are contingent on implementation of intensive plover monitoring and management plans by qualified biologists. It is recommended that landowners seek concurrence with such monitoring plans from either the Service or the State wildlife agency.

Protection of Nests

All suitable piping plover nesting habitat should be identified by a qualified biologist and delineated with posts and warning signs or symbolic fencing on or before April 1 each year. All vehicular access into or through posted nesting habitat should be prohibited. However, prior to hatching, vehicles may pass by such areas along designated vehicle corridors established along the outside edge of plover nesting habitat. Vehicles may also park outside delineated nesting habitat, if beach width and configuration and tidal conditions allow. Vehicle corridors or parking areas should be moved, constricted, or temporarily closed if territorial, courting, or nesting plovers are disturbed by passing or parked vehicles, or if disturbance is anticipated because of unusual tides or expected increases in vehicle use during weekends, holidays, or special events.

If data from several years of plover monitoring suggests that significantly more habitat is available than the local plover population can occupy, some suitable habitat may be left unposted if the following conditions are met:

1. The Service OR a State wildlife agency that is party to an agreement under Section 6 of the ESA provides written concurrence with a plan that:

- A. Estimates the number of pairs likely to nest on the site based on the past monitoring and regional population trends.

AND

- B. Delineates the habitat that will be posted or fenced prior to April 1 to assure a high probability that territorial plovers will select protected areas in which to court and nest. Sites where nesting or courting plovers were observed during the last three seasons as well as other habitat deemed most likely to be pioneered by plovers should be included in the posted and/or fenced area.

AND

- C. Provides for monitoring of piping plovers on the beach by a qualified biologist(s). Generally, the frequency of monitoring should be not less than twice per week prior to May 1 and not less than three times per week thereafter. Monitoring should occur daily whenever moderate to large numbers of vehicles are on the beach. Monitors should document locations of territorial or courting plovers, nest locations, and observations of any reactions of incubating birds to pedestrian or vehicular disturbance.

AND

2. All unposted sites are posted immediately upon detection of territorial plovers.

Protection of Chicks

Sections of beaches where unfledged piping plover chicks are present should be temporarily closed to all vehicles not deemed essential. (See the provisions for essential vehicles below.) Areas where vehicles are prohibited should include all dune, beach, and intertidal habitat within the chicks' foraging range, to be determined by either of the following methods:

1. The vehicle free area should extend 1000 meters on each side of a line drawn through the nest site and perpendicular to the long axis of the beach. The resulting 2000 meter-wide area of protected habitat for plover chicks should extend from the ocean-side low water line to the bay-side low water line or to the farthest extent of dune habitat if no bay-side intertidal habitat exists. However, vehicles may be allowed to pass through portions of the protected area that are considered inaccessible to plover chicks because of steep topography, dense vegetation, or other naturally-occurring obstacles.

OR

2. The Service OR a State wildlife agency that is party to an agreement under Section 6 of the ESA provides written concurrence with a plan that:

- A. Provides for monitoring of all broods during the chick-rearing phase of the breeding season and specifies the frequency of monitoring.

AND

- B. Specifies the minimum size of vehicle-free areas to be established in the vicinity of unfledged broods based on the mobility of broods observed on the site in past years and on the frequency of monitoring. Unless substantial data from past years show that broods on a site stay very close to their nest locations, vehicle-free areas should extend at least 200 meters on each side of the nest site during the first week following hatching. The size and location of the protected area should be adjusted in response to the observed mobility of the brood, but in no case should it be reduced to less than 100 meters on each

side of the brood. In some cases, highly mobile broods may require protected areas up to 1000 meters, even where they are intensively monitored. Protected areas should extend from the ocean-side low water line to the bay-side low water line or to the farthest extent of dune habitat if no bay-side intertidal habitat exists. However, vehicles may be allowed to pass through portions of the protected area that are considered inaccessible to plover chicks because of steep topography, dense vegetation, or other naturally-occurring obstacles. In a few cases, where several years of data documents that piping plovers on a particular site feed in only certain habitat types, the Service or the State wildlife management agency may provide written concurrence that vehicles pose no danger to plovers in other specified habitats on that site.

Timing of Vehicle Restrictions in Chick Habitat

Restrictions on use of vehicles in areas where unfledged plover chicks are present should begin on or before the date that hatching begins and continue until chicks have fledged. For purposes of vehicle management, plover chicks are considered fledged at 35 days of age or when observed in sustained flight for at least 15 meters, whichever occurs first.

When piping plover nests are found before the last egg is laid, restrictions on vehicles should begin on the 26th day after the last egg is laid. This assumes an average incubation period of 27 days, and provides a 1 day margin of error.

When plover nests are found after the last egg has been laid, making it impossible to predict hatch date, restrictions on vehicles should begin on a date determined by one of the following scenarios:

- 1) With intensive monitoring: If the nest is monitored at least twice per day, at dawn and dusk (before 0600 hrs and after 1900 hrs) by a qualified biologist, vehicle use may continue until hatching begins. Nests should be monitored at dawn and dusk to minimize the time that hatching may go undetected if it occurs after dark. Whenever possible, nests should be monitored from a distance with spotting scope or binoculars to minimize disturbance to incubating plovers.

OR

2) Without intensive monitoring: Restrictions should begin on May 15 (the earliest probable hatch date). If the nest is discovered after May 15, then restrictions should start immediately.

If hatching occurs earlier than expected, or chicks are discovered from an unreported nest, restrictions on vehicles should begin immediately.

If ruts are present that are deep enough to restrict movements of plover chicks, then restrictions on vehicles should begin at least 5 days prior to the anticipated hatching date of plover nests. If a plover nest is found with a complete clutch, precluding estimation of hatching date, and deep ruts have been created that could reasonably be expected to impede chick movements, then restrictions on vehicles should begin immediately.

Essential Vehicles

Because it is impossible to completely eliminate the possibility that a vehicle will accidentally crush an unfledged plover chicks, use of vehicles in the vicinity of broods should be avoided whenever possible. However, the Service recognizes that life-threatening situations on the beach may require emergency vehicle response. Furthermore, some "essential vehicles" may be required to provide for safety of pedestrian recreationists, law enforcement, maintenance of public property, or access to private dwellings not otherwise accessible. On large beaches, maintaining the frequency of plover monitoring required to minimize the size and duration of vehicle closures may necessitate the use of vehicles by plover monitors.

Essential vehicles should only travel on sections of beaches where unfledged plover chicks are present if such travel is absolutely necessary and no other reasonable travel routes are available. All steps should be taken to minimize number of trips by essential vehicles through chick habitat areas. Homeowners should consider other means of access, eg. by foot, water, or shuttle services, during periods when chicks are present.

The following procedures should be followed to minimize the probability that chicks will be crushed by essential (non-emergency) vehicles:

1. Essential vehicles should travel through chick habitat areas only during daylight hours, and should be guided by a qualified monitor who has first determined the location of all unfledged plover chicks.
2. Speed of vehicles should not exceed five miles per hour.
3. Use of open 4-wheel motorized all-terrain vehicles (ATVs) or non-motorized all-terrain bicycles is recommended whenever possible for monitoring and law enforcement because of the improved visibility afforded operators.
4. A log should be maintained by the beach manager of the date, time, vehicle number and operator, and purpose of each trip through areas where unfledged chicks are present. Personnel monitoring plovers should maintain and regularly update a log of the numbers and locations of unfledged plover chicks on each beach. Drivers of essential vehicles should review the log each day to determine the most recent number and location of unfledged chicks.

Essential vehicles should avoid driving on the wrack line, and travel should be infrequent enough to avoid creating deep ruts that could impede chick movements. If essential vehicles are creating ruts that could impede chick movements, use of essential vehicles should be further reduced and, if necessary, restricted to emergency vehicles only.

SITE-SPECIFIC MANAGEMENT GUIDANCE

The guidelines provided in this document are based on an extensive review of the scientific literature and are intended to cover the vast majority of situations likely to be encountered on piping plover nesting sites along the U.S. Atlantic Coast. However, the Service recognizes that site-specific conditions may lead to anomalous situations in which departures from this guidance may be safely implemented. The Service recommends that landowners who believe such situations exist on their lands contact either the Service or the State wildlife agency and, if appropriate, arrange for an on-site review. Written documentation of agreements regarding departures from this guidance is recommended.

In some unusual circumstances, Service or State biologists may recognize situations where this guidance provides insufficient protection for piping plovers or their nests. In such a case, the Service or the State wildlife agency may provide written notice to the landowner describing additional measures recommended to prevent take of piping plovers on that site.

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APPENDIX D-5

SEASONAL OCCURRENCE OF BIRDS AT TRACEN CAPE MAY

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COMMON NAME	SCIENTIFIC NAME	Seasonal Occurrence ¹				
		Winter	Spring	Summer	Early Fall	Late Fall
LOONS TO CORMORANTS						
Red-throated Loon	<i>Gavia stellata</i>	C	C		V	C
Common Loon	<i>Gavia immer</i>	F	C	R	S	C
Pied-billed Grebe *	<i>Podilymbus podiceps</i>	F	U	R	S	F
Horned Grebe	<i>Podiceps auritus</i>	F	C			F
Red-necked Grebe	<i>Podiceps grisegena</i>	R	R			R
Cory's Shearwater (p)	<i>Calonectris diomedea</i>			R	V	
Greater Shearwater (p)	<i>Puffinus gravis</i>		V	V		
Sooty Shearwater (p)	<i>Puffinus griseus</i>		S	R		
Audubon's Shearwater (p)	<i>Puffinus lherminieri</i>				V	
Wilson's Storm-Petrel (p)	<i>Oceanites oceanicus</i>		R	S	S	
American White Pelican	<i>Pelecanus erythrorhynchos</i>	V	V			R
Brown Pelican	<i>Pelecanus occidentalis</i>	V	S	U	U	S
Northern Gannet	<i>Morus bassanus</i>	F	C	R	R	C
Great Cormorant	<i>Phalacrocorax carbo</i>	U	U	R	R	U
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	U	C	C	C	C
BITTERNS TO IBISES						
American Bittern **	<i>Botaurus lentiginosus</i>	S	S	V	U	U
Least Bittern *	<i>Ixobrychus exilis</i>	V	U	U	U	S
Great Blue Heron	<i>Ardea herodias</i>	F	F	S	F	C
Great Egret *	<i>Ardea alba</i>	U	C	C	C	U
Snowy Egret *	<i>Egretta thula</i>	R	C	C	C	F
Little Blue Heron *	<i>Egretta caerulea</i>	S	F	F	C	U
Tricolored Heron *	<i>Egretta tricolor</i>	R	U	U	F	U
Cattle Egret *	<i>Bubulcus ibis</i>		U	U	F	U
Green Heron *	<i>Butorides virescens</i>	V	U	F	F	U
Black-crowned Night-Heron *	<i>Nycticorax nycticorax</i>	U	F	F	F	F
Yellow-crowned Night-Heron *	<i>Nyctanassa violacea</i>	V	U	U	U	U
White Ibis	<i>Eudocimus albus</i>		V		V	V
Glossy Ibis *	<i>Plegadis falcinellus</i>	V	C	C	C	F
WATERFOWL						
Tundra Swan	<i>Cygnus columbianus</i>	S	S			F
Mute Swan * (i)	<i>Cygnus olor</i>	F	F	F	F	F
Snow Goose	<i>Chen caerulescens</i>	C	C			C
Brant	<i>Branta bernicla</i>	C	C	R	V	C
Canada Goose *	<i>Branta canadensis</i>	C	C	U	U	C
Wood Duck *	<i>Aix sponsa</i>	S	F	S	F	F
Green-winged Teal	<i>Anas crecca</i>	F	C	R	F	C
American Black Duck *	<i>Anas rubripes</i>	C	C	F	F	C
Mallard *	<i>Anas platyrhynchos</i>	C	C	F	C	C
Northern Pintail	<i>Anas acuta</i>	F	C		U	F
Blue-winged Teal **	<i>Anas discors</i>	R	F	S	F	F
Northern Shoveler	<i>Anas clypeata</i>	F	F		S	F
Gadwall **	<i>Anas strepera</i>	F	C	S	U	C
Eurasian Wigeon	<i>Anas Penelope</i>	R	R		V	R
American Wigeon	<i>Anas Americana</i>	C	C		U	C
Canvasback	<i>Aythya valisineria</i>	S	S			S
Redhead	<i>Aythya Americana</i>	R	R			R
Ring-necked Duck	<i>Aythya collaris</i>	U	U			U
Greater Scaup	<i>Aythya marila</i>	C	C			F
Lesser Scaup	<i>Aythya affinis</i>	F	F			F

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Common Eider	<i>Somateria mollissima</i>	S	R		V	S
King Eider	<i>Somateria spectabilis</i>	R	R		V	R
Harlequin Duck	<i>Histrionicus histrionicus</i>	R	R			R
Oldsquaw	<i>Clangula hyemalis</i>	C	C			F
Black Scoter	<i>Melanitta nigra</i>	F	F	R	S	C
Surf Scoter	<i>Melanitta perspicillata</i>	F	F	R	R	C
White-winged Scoter	<i>Melanitta fusca</i>	F	F	V	V	F
Common Goldeneye	<i>Bucephala clangula</i>	F	F			F
Bufflehead	<i>Bucephala albeola</i>	C	C			C
Hooded Merganser **	<i>Lophodytes cucullatus</i>	F	U			F
Common Merganser	<i>Mergus merganser</i>	S	S			S
Red-breasted Merganser	<i>Mergus serrator</i>	C	C	R	S	C
Ruddy Duck	<i>Oxyura jamaicensis</i>	U	S			U
DIURNAL RAPTORS						
Black Vulture **	<i>Coragyps atratus</i>	F	F	U	U	F
Turkey Vulture *	<i>Cathartes aura</i>	F	F	U	F	C
Osprey *	<i>Pandion haliaetus</i>	V	F	F	C	C
Swallow-tailed Kite	<i>Elanoides forficatus</i>		V	V		
Mississippi Kite	<i>Ictinia mississippiensis</i>		S	R	V	
Bald Eagle *	<i>Haliaeetus leucocephalus</i>	U	S	S	U	U
Northern Harrier *	<i>Circus cyaneus</i>	F	F	S	F	C
Sharp-shinned Hawk	<i>Accipiter striatus</i>	U	F		U	C
Cooper's Hawk **	<i>Accipiter cooperii</i>	S	F	V	U	C
Northern Goshawk	<i>Accipiter gentiles</i>	R	V			S
Red-shouldered Hawk *	<i>Buteo lineatus</i>	U	U	S	U	C
Broad-winged Hawk *	<i>Buteo platypterus</i>		F	S	C	C
Swainson's Hawk	<i>Buteo swainsoni</i>				V	R
Red-tailed Hawk *	<i>Buteo jamaicensis</i>	F	F	U	F	C
Rough-legged Hawk	<i>Buteo lagopus</i>	U	R			U
Golden Eagle	<i>Aquila chrysaetos</i>	R				S
American Kestrel *	<i>Falco sparverius</i>	U	F	S	C	C
Merlin	<i>Falco columbarius</i>	S	U		F	C
Peregrine Falcon *	<i>Falco peregrinus</i>	S	S	S	F	C
GROUSE TO CRANES						
Ring-necked Pheasant **(i)	<i>Phasianus colchicus</i>	R	R	R	R	R
Ruffed Grouse *	<i>Bonasa umbellus</i>	R	R	R	R	R
Wild Turkey *	<i>Meleagris gallopavo</i>	S	S	S	S	S
Northern Bobwhite *	<i>Colinus virginianus</i>	U	U	U	U	U
Black Rail *	<i>Laterallus jamaicensis</i>		S	S	V	V
Clapper Rail *	<i>Rallus longirostris</i>	U	C	C	C	U
King Rail **	<i>Rallus elegans</i>		R	R	V	V
Virginia Rail *	<i>Rallus limicola</i>	U	U	U	U	U
Sora	<i>Porzana Carolina</i>	V	U	V	U	U
Purple Gallinule	<i>Porphyrio martinica</i>	V	V			V
Common Moorhen *	<i>Gallinula chloropus</i>	V	U	U	U	U
American Coot **	<i>Fulica Americana</i>	F	F	R	S	F
Sandhill Crane	<i>Grus canadensis</i>	V	V			R
SHOREBIRDS						
Black-bellied Plover	<i>Pluvialis squatarola</i>	F	C	U	C	C
American Golden-Plover	<i>Pluvialis dominica</i>		R		S	S
Semipalmated Plover	<i>Charadrius semipalmatus</i>	R	C	U	C	C
Piping Plover *	<i>Charadrius melodus</i>	V	U	U	U	S

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Killdeer *	<i>Charadrius vociferus</i>	F	F	U	F	C
American Oystercatcher *	<i>Haematopus palliatus</i>	F	F	F	F	F
Black-necked Stilt **	<i>Himantopus mexicanus</i>		R	V	V	
American Avocet **	<i>Recurvirostra americana</i>			V	V	V
Greater Yellowlegs	<i>Tringa melanoleuca</i>	U	C	U	C	C
Lesser Yellowlegs	<i>Tringa flavipes</i>	S	C	U	C	C
Solitary Sandpiper	<i>Tringa solitaria</i>		U	S	U	S
Willet *	<i>Catoptrophorus semipalmatus</i>	R	C	C	F	S
Spotted Sandpiper **	<i>Actitis macularia</i>		F	U	F	U
Upland Sandpiper	<i>Bartramia longicauda</i>		R	R	S	V
Whimbrel	<i>Numenius phaeopus</i>	V	C	S	F	U
Hudsonian Godwit	<i>Limosa haemastica</i>		V	V	R	R
Marbled Godwit	<i>Limosa fedoa</i>	R	R	V	S	S
Ruddy Turnstone	<i>Arenaria interpres</i>	C	C	U	F	C
Red Knot	<i>Calidris canutus</i>	S	C	F	U	U
Sanderling	<i>Calidris alba</i>	C	C	F	C	C
Semipalmated Sandpiper	<i>Calidris pusilla</i>		C	U	C	C
Western Sandpiper	<i>Calidris mauri</i>	F	S	S	C	C
Least Sandpiper	<i>Calidris minutilla</i>	S	C	U	C	F
White-rumped Sandpiper	<i>Calidris fuscicollis</i>		U	U	U	F
Pectoral Sandpiper	<i>Calidris melanotos</i>		U	S	F	F
Baird's Sandpiper	<i>Calidris bairdii</i>				R	R
Purple Sandpiper	<i>Calidris maritima</i>	C	C		V	C
Dunlin	<i>Calidris alpina</i>	C	C	R	U	C
Stilt Sandpiper	<i>Calidris himantopus</i>		R	S	F	U
Buff-breasted Sandpiper	<i>Tryngites subruficollis</i>				R	R
Ruff	<i>Philomachus pugnax</i>		V	V	V	
Short-billed Dowitcher	<i>Limnodromus griseus</i>	R	C	F	C	U
Long-billed Dowitcher	<i>Limnodromus scolopaceus</i>	R	V		S	U
Common Snipe	<i>Gallinago gallinago</i>	U	C		U	F
American Woodcock *	<i>Scolopax minor</i>	U	U	U	U	F
Wilson's Phalarope	<i>Phalaropus tricolor</i>		R	R	S	R
Red-necked Phalarope (p)	<i>Phalaropus lobatus</i>		V	V	V	V
Red Phalarope (p)	<i>Phalaropus fulicaria</i>		V	V		V
JAEGERS TO ALCIDS						
Pomarine Jaeger (p)	<i>Stercorarius pomarinus</i>		V			R
Parasitic Jaeger (p)	<i>Stercorarius parasiticus</i>		R	V	S	U
Laughing Gull *	<i>Larus atricilla</i>	R	C	C	C	C
Little Gull	<i>Larus minutus</i>	R	S	V	V	R
Black-headed Gull	<i>Larus ridibundus</i>	R	R			R
Bonaparte's Gull	<i>Larus Philadelphia</i>	C	C	R	R	F
Ring-billed Gull	<i>Larus delawarensis</i>	C	C	U	F	C
Herring Gull *	<i>Larus argentatus</i>	C	C	C	C	C
Iceland Gull	<i>Larus glaucoides</i>	R	R	V		V
Lesser Black-backed Gull	<i>Larus fuscus</i>	S	S	V	R	S
Glaucous Gull	<i>Larus hyperboreus</i>	R	R			
Great Black-backed Gull *	<i>Larus marinus</i>	C	C	C	C	C
Black-legged Kittiwake (p)	<i>Rissa tridactyla</i>	R	S			R
Gull-billed Tern *	<i>Sterna nilotica</i>		U	U	U	
Caspian Tern	<i>Sterna caspia</i>		R	V	U	F
Sandwich Tern	<i>Sterna sandvicensis</i>		V	R	S	V
Royal Tern	<i>Sterna maxima</i>	R	F	U	C	C
Roseate Tern **	<i>Sterna dougallii</i>		S	S	R	
Arctic Tern (p)	<i>Sterna paradisaea</i>			V	V	V
Common Tern *	<i>Sterna hirundo</i>		C	C	C	F
Forster's Tern *	<i>Sterna forsteri</i>	S	C	C	C	C

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Least Tern *	<i>Sterna antillarum</i>		F	F	F	
Black Tern	<i>Chlidonias niger</i>		S	R	S	R
Black Skimmer *	<i>Rynchops niger</i>	V	F	F	C	F
Dovekie (p)	<i>Alle alle</i>	V				V
Razorbill (p)	<i>Alca torda</i>	R	V			R
PIGEONS TO WOODPECKERS						
Rock Dove (Feral Pigeon)*(i)	<i>Columba livia</i>	C	C	C	C	C
White-winged Dove	<i>Zenaidura macroura</i>		V		V	V
Mourning Dove *	<i>Zenaidura macroura</i>	C	C	C	C	C
Black-billed Cuckoo *	<i>Coccyzus erythrophthalmus</i>		U	S	U	S
Yellow-billed Cuckoo *	<i>Coccyzus americanus</i>		U	U	F	S
Barn Owl *	<i>Tyto alba</i>	S	S	S	S	U
Eastern Screech-Owl *	<i>Otus asio</i>	F	F	F	F	F
Great-horned Owl *	<i>Bubo virginianus</i>	U	U	U	U	U
Snowy Owl	<i>Nyctea scandiaca</i>	V				V
Barred Owl *	<i>Strix varia</i>	S	S	S	S	S
Long-eared Owl	<i>Asio otus</i>	S	S			U
Short-eared Owl **	<i>Asio flammeus</i>	U	U			U
Northern Saw-whet Owl	<i>Aegolius acadicus</i>	S	S			U
Common Nighthawk	<i>Chordeiles minor</i>		S	V	U	S
Chuck-will's-widow *	<i>Caprimulgus carolinensis</i>		F	F	F	
Whip-poor-will *	<i>Caprimulgus vociferous</i>		F	F	F	S
Chimney Swift *	<i>Chaetura pelagica</i>		C	C	C	F
Ruby-throated Hummingbird *	<i>Archilochus colubris</i>		F	F	F	S
Belted Kingfisher *	<i>Ceryle alcyon</i>	U	U	S	U	U
Red-headed Woodpecker *	<i>Melanerpes erythrocephalus</i>	R	S	S	S	S
Red-bellied Woodpecker *	<i>Melanerpes carolinus</i>	F	F	F	F	F
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	R	S			U
Downy Woodpecker *	<i>Picoides pubescens</i>	F	F	F	F	F
Hairy Woodpecker *	<i>Picoides villosus</i>	U	U	U	U	U
Northern Flicker *	<i>Colaptes auratus</i>	F	C	F	C	C
FLYCATCHERS TO SWALLOWS						
Olive-sided Flycatcher	<i>Contopus cooperi</i>		R		R	V
Eastern Wood-Pewee *	<i>Contopus virens</i>		F	F	C	F
Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>		R		U	R
Acadian Flycatcher *	<i>Empidonax virens</i>		F	F	F	R
Alder Flycatcher	<i>Empidonax alnorum</i>		V		U	S
Willow Flycatcher *	<i>Empidonax traillii</i>		S	U	U	
Least Flycatcher	<i>Empidonax minimus</i>		R		F	S
Eastern Phoebe *	<i>Sayornis phoebe</i>	R	F	S	S	C
Great Crested Flycatcher *	<i>Myiarchus crinitus</i>		F	F	F	U
Western Kingbird	<i>Tyrannus verticalis</i>	V		V	R	R
Eastern Kingbird *	<i>Tyrannus tyrannus</i>		F	F	C	U
Scissor-tailed Flycatcher	<i>Tyrannus forficatus</i>		V	V	V	V
Horned Lark *	<i>Eremophila alpestris</i>	U	S	S	S	U
Purple Martin *	<i>Progne subis</i>		C	C	C	R
Tree Swallow *	<i>Tachycineta bicolor</i>	S	C	C	C	C
Northern Rough-winged Swallow *	<i>Stelgidopteryx serripennis</i>		U	U	F	S
Bank Swallow **	<i>Riparia riparia</i>		F	S	F	S
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>		U	R	U	U
Barn Swallow *	<i>Hirundo rustica</i>		C	C	C	U
JAYS TO WRENS						

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Blue Jay *	<i>Cyanocitta cristata</i>	C	C	F	C	C
American Crow *	<i>Corvus brachyrhynchos</i>	C	C	C	C	C
Fish Crow *	<i>Corvus ossifragus</i>	F	C	C	C	C
Carolina Chickadee *	<i>Parus carolinensis</i>	C	C	C	C	C
Tufted Titmouse *	<i>Baeolophus bicolor</i>	F	F	F	F	F
Red-breasted Nuthatch **	<i>Sitta canadensis</i>	S	U	V	S	F
White-breasted Nuthatch *	<i>Sitta carolinensis</i>	U	U	U	U	U
Brown Creeper *	<i>Certhia Americana</i>	S	U			
Carolina Wren *	<i>Thryothorus ludovicianus</i>	C	C	C	C	C
House Wren *	<i>Troglodytes aedon</i>	R	F	F	F	F
Winter Wren	<i>Troglodytes troglodytes</i>	U	U		R	U
Sedge Wren **	<i>Cistothorus platensis</i>	R	V		V	R
Marsh Wren *	<i>Cistothorus palustris</i>	U	C	C	C	F
KINGLETS TO STARLINGS						
Golden-crowned Kinglet	<i>Regulus satrapa</i>	U	F		V	C
Ruby-crowned Kinglet	<i>Regulus calendula</i>	S	F		R	C
Blue-gray Gnatcatcher *	<i>Poliophtila caerulea</i>	V	F	F	C	U
Eastern Bluebird *	<i>Sialia sialis</i>	U	S	S	S	C
Veery	<i>Catharus fuscescens</i>		U		C	U
Gray-cheeked Thrush	<i>Catharus minimus</i>		R		R	U
Bicknell's Thrush	<i>Catharus bicknelli</i>		V		V	S
Swainson's Thrush	<i>Catharus ustulatus</i>		S		U	F
Hermit Thrush	<i>Catharus guttatus</i>	U	F		V	C
Wood Thrush *	<i>Hylocichla mustelina</i>		F	F	F	S
American Robin *	<i>Turdus migratorius</i>	C	C	C	C	C
Gray Catbird *	<i>Dumetella carolinensis</i>	U	C	C	C	C
Northern Mockingbird *	<i>Mimus polyglottos</i>	C	C	C	C	C
Brown Thrasher *	<i>Toxostoma rufum</i>	U	F	U	U	F
American Pipit	<i>Anthus rubescens</i>	S	S		V	F
Cedar Waxwing *	<i>Bombicilla cedrorum</i>	F	F	F	C	C
Northern Shrike	<i>Lanius excubitor</i>	V				V
Loggerhead Shrike	<i>Lanius ludovicianus</i>				V	V
European Starling *(i)	<i>Sturnus vulgaris</i>	C	C	C	C	C
VIREOS AND WARBLERS						
White-eyed Vireo *	<i>Vireo griseus</i>	V	F	F	F	S
Blue-headed Vireo	<i>Vireo solitarius</i>	V	U		S	U
Yellow-throated Vireo *	<i>Vireo flavifrons</i>		U	S	U	S
Warbling Vireo	<i>Vireo gilvus</i>		S		U	S
Philadelphia Vireo	<i>Vireo philadelphicus</i>		V		U	U
Red-eyed Vireo *	<i>Vireo olivaceus</i>		C	F	C	F
Blue-winged Warbler *	<i>Vermivora pinus</i>		F	F	F	U
Golden-winged Warbler	<i>Vermivora chrysopetra</i>		R		S	R
Tennessee Warbler	<i>Vermivora peregrina</i>		S		U	U
Orange-crowned Warbler	<i>Vermivora celata</i>	R	R			S
Nashville Warbler	<i>Vermivora ruficapilla</i>	V	U		F	U
Northern Parula *	<i>Parula americana</i>		F	R	F	C
Yellow Warbler *	<i>Dendroica petechia</i>		C	F	C	S
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>		U		F	U
Magnolia Warbler	<i>Dendroica magnolia</i>		F		F	F
Cape May Warbler	<i>Dendroica tigrina</i>		U		F	F
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>		F		F	F
Yellow-rumped Warbler	<i>Dendroica coronata</i>	C	C		S	C
Black-throated Green Warbler	<i>Dendroica virens</i>		F		F	F
Blackburnian Warbler	<i>Dendroica fusca</i>		U		F	U

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Yellow-throated Warbler *	<i>Dendroica dominica</i>		F	F	F	R
Pine Warbler *	<i>Dendroica pinus</i>	V	C	C	C	F
Prairie Warbler *	<i>Dendroica discolor</i>	V	F	F	F	S
Palm Warbler	<i>Dendroica palmarum</i>	S	U		U	C
Bay-breasted Warbler	<i>Dendroica castanea</i>		U		U	S
Blackpoll Warbler	<i>Dendroica striata</i>		F	V	U	C
Cerulean Warbler **	<i>Dendroica cerulea</i>		R	V	R	V
Black-and-white Warbler *	<i>Mniotilta varia</i>		C	F	C	F
American Redstart *	<i>Setophaga ruticilla</i>		C	U	C	F
Prothonotary Warbler *	<i>Protonotaria citrea</i>		F	F	U	R
Worm-eating Warbler *	<i>Helmitheros vermivora</i>		F	U	F	S
Ovenbird *	<i>Seiurus aurocapillus</i>		C	C	C	U
Northern Waterthrush	<i>Seiurus noveboracensis</i>		U		C	F
Louisiana Waterthrush *	<i>Seiurus motacilla</i>		U	U	U	
Kentucky Warbler *	<i>Oporornis formosus</i>		U	U	U	
Connecticut Warbler	<i>Oporornis agilis</i>				U	U
Mourning Warbler	<i>Oporornis philadelphia</i>		R		U	R
Common Yellowthroat *	<i>Geothlypis trichas</i>	R	C	C	C	F
Hooded Warbler *	<i>Wilsonia citrina</i>		U	U	U	R
Wilson's Warbler	<i>Wilsonia pusilla</i>		S		U	R
Canada Warbler	<i>Wilsonia Canadensis</i>		U		F	S
Yellow-breasted Chat *	<i>Icteria virens</i>	V	F	F	U	S
TANAGERS TO SPARROWS						
Summer Tanager *	<i>Piranga rubra</i>		U	U	U	R
Scarlet Tanager *	<i>Piranga olivacea</i>		F	F	F	C
Northern Cardinal *	<i>Cardinalis cardinalis</i>	C	C	C	C	C
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>		F	V	F	F
Blue Grosbeak *	<i>Guiraca caerulea</i>		F	F	F	U
Indigo Bunting *	<i>Passerina cyanea</i>		C	F	C	F
Dickcissel	<i>Spiza americana</i>	R	R		S	S
Eastern Towhee *	<i>Pipilo erythrophthalmus</i>	U	C	C	C	F
American Tree Sparrow	<i>Spizella arborea</i>	S	R			S
Chipping Sparrow *	<i>Spizella passerina</i>	S	C	C	C	C
Clay-colored Sparrow	<i>Spizella pallida</i>	V			R	R
Field Sparrow *	<i>Spizella pusilla</i>	F	F	F	F	C
Vesper Sparrow	<i>Poocetes gramineus</i>		V			S
Lark Sparrow	<i>Chondestes grammacus</i>				R	R
Savannah Sparrow **	<i>Passerculus sandwichensis</i>	F	F		U	C
Grasshopper Sparrow **	<i>Ammodramus savannarum</i>		V	V	V	R
Saltmarsh Sharp-tailed Sparrow *	<i>Ammodramus caudacutus</i>	U	F	F	F	U
Nelson's Sharp-tailed Sparrow	<i>Ammodramus nelsoni</i>	S	R			U
Seaside Sparrow *	<i>Ammodramus maritimus</i>	U	C	C	C	F
Fox Sparrow	<i>Passerella iliaca</i>	U	U			F
Song Sparrow *	<i>Melospiza melodia</i>	C	C	C	C	C
Lincoln's Sparrow	<i>Melospiza lincolni</i>		R			U
Swamp Sparrow *	<i>Melospiza georgiana</i>	F	F	F	F	C
White-throated Sparrow	<i>Zonotrichia albicollis</i>	C	C		V	C
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	R	R			U
Dark-eyed Junco	<i>Junco hyemalis</i>	C	C			C
Lapland Longspur	<i>Calcarius lapponicus</i>	R	R			R
Snow Bunting	<i>Plectrophenax nivalis</i>	S	R			U
BLACKBIRDS TO OLD WORLD SPARROWS						
Bobolink	<i>Dolichonyx oryzivorus</i>		F	U	C	F
Red-winged Blackbird *	<i>Agelaius phoeniceus</i>	C	C	C	C	C

COMMON NAME	SCIENTIFIC NAME	Seasonal Occurrence ¹				
		Winter	Spring	Summer	Early Fall	Late Fall
Eastern Meadowlark *	<i>Sturnella magna</i>	F	F	U	U	C
Yellow-headed Blackbird	<i>Xanthocephalus xanthocephalus</i>	V	V	V	R	V
Rusty Blackbird	<i>Euphagus carolinus</i>	U	U			F
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>	V				V
Boat-tailed Grackle *	<i>Quiscalus major</i>	F	F	F	F	F
Common Grackle *	<i>Quiscalus quiscula</i>	C	C	C	C	C
Brown-headed Cowbird *	<i>Molothrus ater</i>	C	C	C	C	C
Orchard Oriole *	<i>Icterus spurius</i>		F	F	F	V
Baltimore Oriole *	<i>Icterus galbula</i>	R	F	U	C	U
Purple Finch	<i>Carpodacus purpureus</i>	U	S		R	F
Red Crossbill	<i>Loxia curvirostra</i>	V				V
House Finch *(i)	<i>Carpodacus mexicanus</i>	C	C	C	C	C
Common Redpoll	<i>Carduelis flammea</i>	R	V			R
Pine Siskin	<i>Carduelis pinus</i>	U	S			U
American Goldfinch *	<i>Carduelis tristis</i>	F	C	F	C	C
Evening Grosbeak	<i>Coccothraustes vespertinus</i>	R	R			R
House Sparrow *(i)	<i>Passer domesticus</i>	C	C	C	C	C

Source: Cape May Bird Observatory: New Jersey Audubon Society 1997

Notes:

¹Winter: December-February
Spring: March-May
Summer: June-mid-July
Early Fall: mid-July-mid-September
Late Fall: mid-September-November

C: common should not miss; more than 20 individuals per day
F: fairly common usually seen; 5 to 20 individuals per day
U: uncommon seen in limited numbers; 1 to 4 per day
S: scarce usually present, but not seen daily
R: rare, seen only a few times per season
V: very rare very infrequent; fewer than 1 record per season
P: pelagic found primarily at sea; listed status is that from shore
I: introduced not native to New Jersey
*: regular breeder
***: irregular, presumed, or former breeder

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APPENDIX D-6

US COAST GUARD TRACEN CAPE MAY BEACH NESTING BIRD MANAGEMENT PLAN

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US COAST GUARD TRACEN CAPE MAY BEACH NESTING BIRD MANAGEMENT PLAN

Prepared by: LTjg Jon Perry

Modified by: Chris Hajduk

New Jersey Department of Environmental Protection, Division of Fish and Wildlife –
Endangered and Nongame Species Program

Training Center Cape May

Facilities Engineering

January, 2002

Purpose:

The purpose of this management plan is to provide a framework for cooperation between the US Coast Guard Training Center Cape May (hereinafter also “TRACEN Cape May” or “Training Center”) and the New Jersey Div. of Fish and Wildlife (hereinafter also “DFW” or “the division”) in the stewardship of endangered beach nesting birds occurring on TRACEN Cape May’s beach. This plan seeks to provide for the long-term conservation and restoration of black skimmer (*Rynchops niger*), least terns (*Sterna antillarum*), and piping plover (*Charadrius melodus*) populations in TRACEN Cape May and the state while balancing potentially conflicting missions. The plan defines and describes the roles and responsibilities of TRACEN Cape May and DFW in the protection and management of black skimmers, least terns and piping plovers within the Training Center. Specifically, this plan endeavors to increase the nesting success of least terns and piping plovers in the Training Center by reducing detrimental human activities and decreasing predation. Through this plan we hope to affect a progressive shift of specific beach nesting bird management responsibilities to the Training Center.

Recovery Goals:

Piping plovers: the goal of this plan is to maintain a five-year average of 5-7 pairs nesting on TRACEN Cape May’s beach, fledging an average of at least 1.25 chicks per nesting pair.

Least terns: a nesting colony of least terns should be present, on average, 3-4 years out of any 5-year period. No fledging rate goal is set for least terns, but the nesting colony should be successful in the majority of years when nesting birds are present.

Nesting Zones:

TRACEN Cape May's entire beach is considered a nesting zone based on historical use by beach nesting birds. The relative importance of protective management in each zone was based on existing human uses, beach and habitat stability, and historical use by the birds.

Management Issues: Management issues form the basis or framework for this plan. That is, we attempt to define the major issues and possible solutions on an issue-by-issue basis and describe how they apply to the nesting zone.

1. **Predation.** Predation problems on the Training Center come from raccoons (*Procyon lotor*), feral cats (*Felis catus*), gulls (*Larus spp.*), crows (*Corvus spp.*), and red fox (*Vulpes vulpes*). Reducing predation will involve reducing or eliminating provisioning of food from refuse and hand feeding, using predator exclosures, educational outreach, and predator removal.

TRACEN Cape May

- The Training Center works with the Department of Agriculture to trap cats, foxes, raccoons & opossums in a humane manner. Some of the areas currently identified as feral cat concentration areas include the area near the dumpsters by the ISD and Small Boat Station.
- Except as prohibited by existing laws or regulations, the Training Center will not actively block predator control measures recommended by DFW.
- TRACEN Cape May will erect predator exclosures on piping plover nests where and when appropriate.

Div. of Fish and Wildlife

- DFW will provide guidance to the Training Center regarding changes to predator control policies. TRACEN has a stock of predator exclosures supplied by the DFW.

2. **Human Disturbance.** The broad area of human disturbance includes any human activities that indirectly harm nesting birds by disrupting nesting - including incubation and care of chicks.

TRACEN Cape May

- The beach at TRACEN Cape May is managed as a "vehicle-free" and "people-free" area as the beach is closed to all persons with the following exceptions: TRACEN Environmental Protection and state DFW personnel. USCG Training Center Cape May's Security Force is allowed to drive on the beach only in order to warn off trespassers provided that they drive no more than 10 yards from the waters edge.
- TRACEN Cape May will post all active nesting areas (within and outside of designated nesting zones) with appropriate signs and "symbolic" (string

and post) fencing and remove within 10 days of the end of any nesting activity.

Div. of Fish and Wildlife

- DFW will continue to provide signs for the nesting area.
- All fencing erected by TRACEN personnel, whether pre-season fenced or erected around individual nests or colonies during the nesting season, will be removed in a timely manner by TRACEN.

3. **Beach Management and Maintenance.** Beach maintenance includes the activities that TRACEN Cape May undertakes to physically maintain the beaches and dunes including refuse pickup, dune building and enhancement, sand mining, and beach fill. These activities affect or can affect beach-nesting birds on many levels including nesting and feeding habitat quality, disturbance, and the potential to directly destroy nests and/or chicks.

- **Beach Raking.** Beach rakes can inadvertently destroy unprotected nests and kill chicks. Beach raking can also diminish nesting habitat suitability by removing shell fragments and sparse vegetation. Foraging habitat is diminished by removal of natural wrack, an important feeding substrate. Cessation of beach raking when and where plover chicks are present is essential in all areas to avoid killing chicks. In the primary nesting areas, reducing or eliminating beach raking is desirable to ensure adequate feeding substrate to support adults and their broods.

TRACEN Cape May

- The Training Center's Beach will not be raked.
- **Refuse Containers.** Regular servicing of trashcans and recycling containers located on the beach increases vehicle traffic on the beach with the inherent risks to unprotected nests and chicks.

TRACEN Cape May

- The Training Center will have no refuse containers on the beach as the beach is closed to all persons.
- **Dune Management.** Dune management can either enhance or reduce habitat. Because the effects and applicable techniques will vary greatly by location and existing conditions of the beach and dunes, it is difficult to prescribe specific measures. In general dune management in the nesting zones should be aimed at developing a "natural" dune system - one with irregular face, occasional breaches, and a low-lying sparsely vegetated foredune.
- TRACEN Cape May is not actively involved in dune management nor do they fertilize the dunes.
- **Beach Replenishment.** DFW recognizes that beach replenishment has been both directly and indirectly beneficial to the maintenance of nesting habitat in all nesting zones. Continued beach replenishment will probably be necessary to maintain habitat in these areas. Concerns about beach replenishment, therefore, relate primarily to timing and avoiding disturbance and/or

destruction of existing nests or chicks. Because all of the nesting beaches are currently included in an ongoing project with the U.S. Army Corps of Engineers, the DFW will continue to work primarily with USACOE and the US Fish and Wildlife Service to ensure the beach replenishment projects have no negative impact on beach nesting birds on TRACEN Cape May.

TRACEN Cape May

- The US Army Corps of Engineers has a 50-year project in place where they work on replenishing the Training Center's beach biennially. They last worked on the Training Center's beach in 1999.
 - If DFW determines that habitat in the area of a proposed beach replenishment project is unsuitable for nesting and/or that adequate safeguards have been taken to minimize risks to any nesting black skimmers, piping plovers, and least terns, DFW will recommend to USFWS and other permitting authorities that timing restrictions be waived. For this determination to be made, DFW must be convinced that the conditions described above have been met.
 - No beach replenishment activities that are likely to destroy any active piping plover or least tern nests or harm least tern or piping plover chicks shall be conducted in any location.
4. **Education and Outreach.** This component cuts across all of the other management issues as it is aimed at reducing human disturbance, reducing predation, and reducing the detrimental impacts of beach maintenance.

TRACEN Cape May

- The Training Center places signs indicating the beach is off limits to all persons due to the presence of endangered species.

Div. of Fish and Wildlife

- DFW will conduct training to show beach nesting bird areas, nesting activity, exclosure erection techniques to Training Center officials as requested by the Training Center.

5. **Other Provisions**

- DFW will regularly inform the Training Center regarding changes in black skimmer, piping plover, and least tern nesting activity that may affect any of the provisions of this plan or that it believes would be of general interest to the Training Center.
- DFW will also provide the Training Center with a brief summary of nesting outcome by the end of each calendar year.
- DFW will work with TRACEN Cape May to support implementation of this plan.

APPENDIX D-7

ATTRACTING AND MANAGING PURPLE MARTINS

PURPLE MARTIN CONSERVATION ORGANIZATION

<http://www.purplemartin.org/main/mgt.html>

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ATTRACTING & MANAGING purple martins

Over one million North Americans put up housing for Purple Martins. Unfortunately, many of these folks are unable to attract breeding martins. The advice given here will increase your chances of attracting martins. Once martins nest at your location, they will come back every year if you manage the site properly. Landlords who lose their entire colony from one year to the next often suspect their 'flock' died in a storm during migration or was poisoned by pesticides on their wintering grounds. These scenarios are unlikely; the martins that share a breeding site do not migrate or overwinter as a group. The reason for total colony loss is most often the result of something that happened in the landlord's own back yard during the nesting season. Good management practices can prevent or minimize most of these problems.

Species Profile

Purple Martins (*Progne subis*) are the largest member of the swallow family in North America, measuring 7 1/2 inches (19 cm) long and weighing 1.9 ounces (55 grams). Taxonomically they are placed in the Kingdom: Animalia; Phylum: Chordata; Subphylum: Vertebrata; Class: Aves; Order: Passeriformes; and Family: Hirundinidae. Three races (subspecies) are recognized: ***Progne subis subis*** breeding in eastern North America and eastern Mexico; ***Progne subis hesperia*** breeding in the deserts of Arizona, western Mexico, and Baja California; and ***Progne subis arboricola*** breeding along the Pacific coast of the United States and Canada, and in the Rocky Mountains.

Purple Martins spend the non-breeding season in Brazil then migrate to North America to nest. East of the Rockies they are totally dependent on human-supplied housing. West of the Rockies and in the deserts they largely nest in their ancestral ways, in abandoned woodpecker nest cavities. In the Pacific northwest, Martins are beginning to use gourds and clusters of single-unit boxes for nesting.

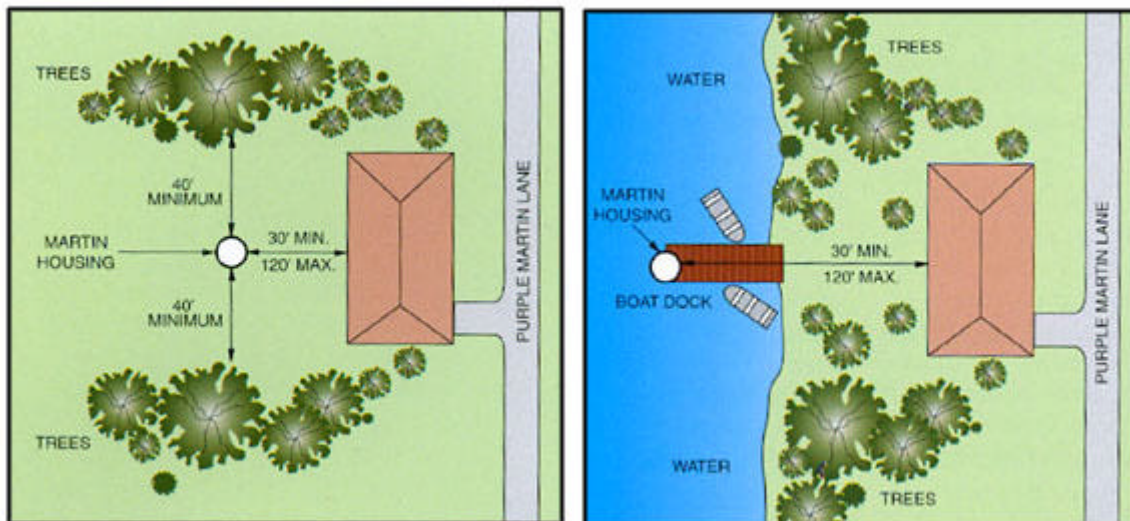
The pair-bond of the Purple Martin is monogamous. The male and female cooperate equally in building the nest out of mud, grass and twigs. The female lays two to seven pure-white eggs at a rate of one egg per day. The female incubates the clutch for approximately fifteen days, then the young hatch. The parents both feed the young continuously for a period of 26-32 days until the young fledge. The young continue to be

dependent on their parents for food and training for an additional one to two weeks after fledging. It's not uncommon for the fledglings to return to their human-supplied housing at night to sleep during this period. [\(Click to see an animation of the growth of a nestling purple martin.\)](#)

Martins, like all swallows, are aerial insectivores. They eat only flying insects, which they catch in flight. Their diet is diverse, including dragonflies, damselflies, flies, midges, mayflies, stinkbugs, leafhoppers, Japanese beetles, June bugs, butterflies, moths, grasshoppers, cicadas, bees, wasps, flying ants, and ballooning spiders. Martins are not, however, prodigious consumers of mosquitoes as is so often claimed by companies that manufacture martin housing. An intensive 3-year diet study conducted at PMCA headquarters in Edinboro, PA, failed to find a single mosquito among the 350 diet samples collected from parent martins bringing beakfuls of insects to their young. The samples were collected from martins during all hours of the day, all season long, and in numerous habitats, including mosquito-infested ones. Purple Martins and freshwater mosquitoes rarely ever cross paths. Martins are daytime feeders, and feed high in the sky; mosquitoes, on the other hand, stay low in damp places during daylight hours, or only come out at night. Since Purple Martins feed only on flying insects, they are extremely vulnerable to starvation during extended periods of cool and/or rainy weather.

Location

The major reason people fail to attract martins is that they place their martin housing incorrectly, or their site is inappropriate martin habitat to begin with. Martins have very specific aerial space requirements. Housing should be placed in the center of the most open spot available, about 30-120 feet from human housing. There should be no trees taller than the martin housing within 40 feet, preferably 60 feet. Generally, the farther the housing is placed from trees, the better. See site Diagram A. In the southern half of their breeding range, martins are less particular about house placement. Southern landlords can sometimes place housing within 15-20 feet of trees and still attract martins. Height of the housing can be anywhere from 10-20 feet. Keep tall bushes, shrubs and vines away from the pole. Do not attach wires to a martin house, especially if they lead to trees, buildings, or to the ground. If your yard has too many trees near the martin housing, relocate the housing to a more open area, mount the housing higher, or prune (or remove) trees to create a more open site. If you have a wooded lot, but live near a body of water, refer to site Diagram B. Boat docks make ideal locations for mounting a martin house or gourd rack.



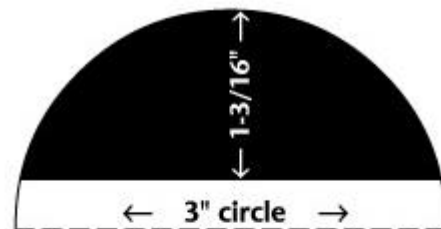
Timing

Most 'would-be' martin landlords rush to get their martin housing opened up for the arrival of martin "scouts" in their particular area. This is 4-5 weeks too early for new sites, and decreases chances for success. Contrary to popular folklore, "scouts" are not looking for new breeding sites for their flocks. "Scouts" are simply the first martins to arrive in, or pass through an area on their way back to their previous year's nesting sites. These martins aren't likely to switch to new housing. Prospective landlords should not open their housing until about four weeks after the first martins are scheduled to return to their area (see map at the bottom of this page). No matter where you live, keep your housing open through August. Martins may arrive and begin nesting as late as the end of June anywhere in North America, and in July and August this year's young will be scouting for next year's breeding sites. Landlords of active sites can leave their housing completely closed up until the martins return and land on the housing. Purple Martins exhibit a very high level of site fidelity. Once they have bred successfully at a specific location, the same individuals return there year after year.

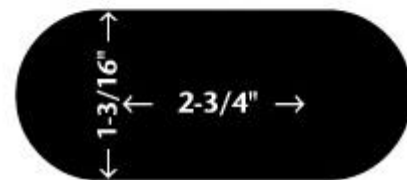
Competition

If any other species of bird is allowed to claim martin housing first at an uncolonized site, any martins that may come around are not likely to stay because they will be aggressively chased away. All birds set up territories around their nest sites and defend them against other birds. When [House Sparrows](#) or [European Starlings](#) lay first claim to martin housing at unestablished sites, they fill the compartments with their nests, then chase off investigating martins. At established colony sites, House Sparrows and starlings will fight with nesting martins, kill their nestlings, and/or break eggs. Allowing House Sparrows and starlings to nest in martin housing will significantly reduce martin occupancy and productivity. Controlling nest-site competitors may require repeated lowering of the housing for nest tear-outs, and in the case of the non-native House Sparrow and European Starling, trapping and/or shooting. Starling-resistant entrance holes can be used to keep starlings from claiming martin housing. Should native bird species (e.g., [Tree Swallows](#), [Eastern Bluebirds](#), Great Crested Flycatchers, etc.) try to take over your empty martin housing, temporarily plug all the entrance holes with door stops or paper cups, then put up appropriate, single-unit housing elsewhere on your property. Once these other birds have accepted the new housing, reopen the martin housing. Housing should be stored inside for the winter (or closed up) to keep paper wasps, squirrels, and other birds from claiming the house before the martins return.

A Starling-resistant Entrance Hole



These diagrams show how to cut a starling-resistant entrance hole for your martin housing. The height dimension is extremely critical. If made a hair too big, starlings will get in; if made a hair too small, martins won't be able to. Cut the crescent-shaped entrance hole with a forstner drill bit and a jigsaw. If cutting the crescent hole seems too difficult, try the oval slot shown below, which is cut with a 1&3/16" forstner bit, or cut a rectangular hole with the same dimensions. All have been successful at excluding starlings, while still permitting Purple Martins to enter. Also, placement is important. The bottom of the entrance hole may be placed flush with the porch floor, or 1/4" to 1/2" above the porch, but should not be any higher.



Housing

Houses and gourds should be painted white, or a light pastel color; trim can be any color. White housing seems to attract martins best. White housing reflects the heat of the sun, keeping nestlings cooler. Compartment floor dimensions should measure at least 6"x6," but 7" x 12" offers better protection against predators and weather, if starlings are controlled. Compartment height can be from 5" to 7" high. Place entrance holes about 1" above the floor. Hole size can range from 1-3/4" up to 2-1/4", but 2-1/8" is recommended. Many published plans for martin housing (and some manufactured houses) are made to improper dimensions. If your housing is unsuccessful, check the dimensions and modify where needed.

Look for housing designed to raise and lower vertically, with easy access to compartments. Landlords may need to lower housing daily to evict nest-site competitors, or to check on martin nestlings. Systems that

telescope up and down, or raise and lower with a pulley and winch, are the most practical. Nest checks will not cause martins to abandon their nests or their colony site. Number the compartments and keep written records.

Replacing Active Housing

The same martins return each year and may abandon the site if the housing they are used to is gone, or drastically altered. To safely replace a single active house, place the new housing near the housing you plan to remove, and give the martins an entire season to get used to it. Do not remove the active housing until some of the martins have accepted and bred in the new housing for at least one season. Once martins have nested in the new housing, you can remove the old house, or put an additional new house in its place. Landlords with several active houses can replace a house between seasons without risk of colony loss.

Predation

The most common reason martins abandon their colony site is because predators have raided their nests. It only takes one foray up a martin pole by a snake, raccoon, or squirrel, or a few visits by an owl, hawk or crow, to cause all the surviving birds to abandon the site. Landlords who don't conduct weekly nest checks may never know martins, nestlings, or eggs are disappearing. All martin poles (wooden or metal) can easily be climbed by predators and should be equipped with pole-guards. Martin houses that have become regular targets for hawks, owls, or crows should be equipped with owl guards. Landlords should be alert for evidence of predation (e.g. dropped owl feathers, plucked martin feathers, chewed-off martin wings, etc.) under martin housing.

Weather Extremes

Since martins feed solely on flying insects, they are extremely vulnerable to weather conditions that affect insect availability. Prolonged bad weather, such as rain, snow, cool temperatures, and/or heavy winds, all reduce or eliminate insect flight. If poor weather persists for more than 2 or 3 days, martins begin to die of starvation. Heat waves and droughts can also be a problem. When air temperatures go above 100° F. for many days, nestlings can perish from overheating. Prolonged drought can also adversely affect insect numbers. Some weather conditions may contribute to a population explosion of external parasites normally found in martin nests, including fleas, nest mites, and blowfly larvae. Never use pesticides in nests or boxes. The safest way to reduce the number of nest parasites is to conduct a "nest replacement." First, remove the nestlings to a temporary container. Throw out the old parasite-infested nest. Then replace the old nest material with clean, dry wood shavings, pine straw (dried pine needles), or dry straw. Shape a shallow bowl in the new material and place the nestlings back in the nest.

Range & Migration Map

The entire, world-wide breeding range of the Purple Martin is shown in purple below. Horizontal lines mark average arrival dates of older martins at established colony sites. Yearling martins (subadults), the age-group that typically colonize new breeding sites, don't begin arriving until 4-6 weeks for the northern third of the continent, 6-8 weeks for the middle third of the continent, and 8-10 weeks in the southern third of the continent after these dates, and continue arriving for an additional 4-6 weeks in the north, 10-12 weeks in the south. This means martins can be attracted to new housing through late-May in the south, late-June in the north. West of the Rocky Mountains, Purple Martins have different nesting habits. In the southwest, martins nest only in old woodpecker cavities excavated in giant cacti. In the Pacific Northwest, martins use gourds and single-unit boxes, but not multiple-room houses.

This arrival information does not take into account two-year-old (adult) birds that didn't breed as subadults, OR, birds of any age that had reproductive failure the previous year. Both of these categories of adult-plumaged returning birds will (or might be) looking for new breeding sites, AND will be arriving before subadult birds. Birds that lost their housing because it was removed or destroyed between nesting seasons will also be looking for new sites. Sometimes landlords with optimal habitat may be able to "steal" martins from

housing that is in marginal habitat or that is neglected and overrun with starlings and House Sparrows. Learning to be both patient (in waiting to attract martins) and persistent (in controlling undesirable birds) during the lengthy time window that runs from the return of adults, most of which are not looking for new breeding sites, through the period when prospecting subadults would begin arriving, is a skill that not all prospective landlords have mastered. As a result of this lapse in efforts, their martin housing can end up full of aggressive nest-site competitors that drive off timid subadult martins. Most housing today lowers easily and opens up for trapping and control of starlings and House Sparrows. In addition, there are now several kinds of starling-resistant entrance holes widely available, and numerous kinds of traps for sparrows and starlings.

The PMCA recommends to open your housing up around the dates adult martins are first scheduled to begin arriving in your area, BUT ONLY IF you are willing to follow through with the practices listed here: Use starling-resistant entrance holes. Be relentless in controlling House Sparrows and starlings. We also recommend use of the vocalization recording.

Be prepared ahead of time to deal with native nest-site competitors, too, since Eastern Bluebirds, Tree Swallows, Great Crested Flycatchers and House Wrens may show an interest in your martin houses and gourds. Have boxes and gourds up early for these desirable birds, and if necessary, briefly close martin housing to help “steer” these birds into the appropriate nesting places in your yard.



Edinboro University of Pennsylvania ■ Edinboro PA 16444 ■ U.S.A.

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APPENDIX D-8

RESULTS OF SEABEACH AMARANTH SURVEY

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August 19, 2002

Mr. Carlo Popolizio
USFWS
New Jersey Ecological Services Field Office
927 N. Main Street, Building D
Pleasantville, New Jersey 08232

Reference: Seabeach Amaranth (*Amaranthus pumilus*) Survey

Dear Mr. Popolizio,

While Seabeach Amaranth (*Amaranthus pumilus*) has not been documented on the Installation, USFWS has indicated that the species is expanding its range into new areas, which possibly includes U.S. Coast Guard (USCG) Training Center (TRACEN) Cape May. Based on this communication from Mr. John Staples (USFWS – New Jersey Ecological Services Field Office) dated 26 February 2002, a survey has been conducted in conjunction with the preparation of the U.S. Coast Guard (USCG) Integrated Natural Resources Management Plan (INRMP) and Environmental Assessment (EA) for the USCG TRACEN Cape May.

The INRMP and EA are being developed for USCG TRACEN Cape May in accordance with the National Environmental Policy Act (NEPA), COMDINST 5090.3 – *Natural Resources Management*, COMDPUB 5090.1 – *Commanding Officer's Environmental Guide*, COMDINST M16475.1B – *NEPA Implementing Procedures and Policy for Considering Environmental Impacts*. In addition, although the USCG TRACEN Cape May is a Department of Transportation facility, the tenets established for Department of Defense installations under the Sikes Act (16 United States Code [U.S.C.] 670a et seq.) will be adhered to where applicable. The preparation of an INRMP may be considered a major Federal action. Therefore, this INRMP also includes an EA for the implementation of this plan at USCG TRACEN Cape May. In addition, in accordance with §670a(2) of the Sikes Act, concurrence on the INRMP with the U.S. Fish and Wildlife Service (Service) and the New Jersey Department of Environmental Protection – Department of Fish and Wildlife (NJDFW) the INRMP will be requested.

BACKGROUND:

Seabeach amaranth has been documented in Monmouth County and Upper Township, Cape May County, New Jersey. Seabeach amaranth is an annual plant endemic to the Atlantic Coast beaches and barrier islands. The primary habitat of seabeach amaranth consists of overwash flats at accreting ends of islands, lower fore dunes, and upper strands of non-eroding beaches (landward of the wrackline), although the species occasionally establishes small temporary populations in other habitats, including sound-side beaches, blowouts in fore dunes, inter-dunal areas, and on sand and shell material deposited for beach replenishment or as dredge spoil. Seabeach amaranth usually is found growing on a nearly pure sand substrate, occasionally with shell fragments mixed in.

Seabeach amaranth occupies elevations from eight inches to five feet above mean high tide and is intolerant of even occasional flooding during its growing season of early June into late fall. The habitat of seabeach amaranth is sparsely vegetated with annual herbs and, less commonly, perennial herbs (mostly grasses), and scattered shrubs. Vegetative associates of seabeach amaranth include sea rocket (*Cakile edentula*), seabeach spurge (*Chamaesyce polygonifolia*), and

other species of open, sandy beach habitats. Seabeach amaranth is often associated with beaches managed for the protection of beach nesting birds such as the piping plover and least tern. Threats to seabeach amaranth include beach stabilization efforts (particularly the use of beach armoring, such as sea walls and riprap), intensive recreational use, and herbivory by webworms. Seabeach amaranth is sensitive to trampling and crushing by pedestrian or vehicular traffic.

SURVEY RESULTS:

A seabeach amaranth survey was conducted on 7 August 2002 to determine if the species is located on the Installation. Mr. Gino Giumarro (engineering-environmental Management [e²M]), Mr. Brian Hoppy (e²M), Mr. Chris Hajduk (TRACEN Cape May), and Petty Officer Rockledge (TRACEN Cape May) performed the survey between 900 hrs and 1500 hrs. Line transects were utilized along the high tide line with individuals spaced four feet into the overwash area. Individuals performed this pedestrian survey walking parallel to other survey members, while stopping every five feet to examine for occurrence of the plant. The survey began on the east section of the beach and concluded at the southern property boundary. Upon reaching the western property boundary, the survey team performed a 'walk' of the same area to ensure proper coverage. Species observed during the survey included: beach grass (*Ammophila breviligulata*), Bermuda grass (*Cynodon dactylon*), cocklebur (*Xanthium spinosum*), saltwort (*Batis maritima*), searocket, seaside goldenrod (*Solidago sempervirens*), and seaside spurge. **No occurrence** of seabeach amaranth was observed during the survey.

USCG TRACEN Cape May will continue to perform additional surveys for the presence of the plant prior to all land disturbing activities, such as beach replenishment. The USFWS New Jersey Ecological Services Field Office will be copied on the results of future surveys.

Enclosed, please find a map depicting the location of the USCG TRACEN Cape May noting the area surveyed. e²M will also be contacting your office in the near future to request your participation in collaborative INRMP Focus Group designed to ensure that the management goals, objectives, and actions of the INRMP reflect the goals of your organization. Should you have any questions concerning the survey, please contact me at (434) 244-6497 or Brian Hoppy of our Philadelphia office at (610) 649-8064. Thank you.

Sincerely,

engineering-environmental Management, Inc.

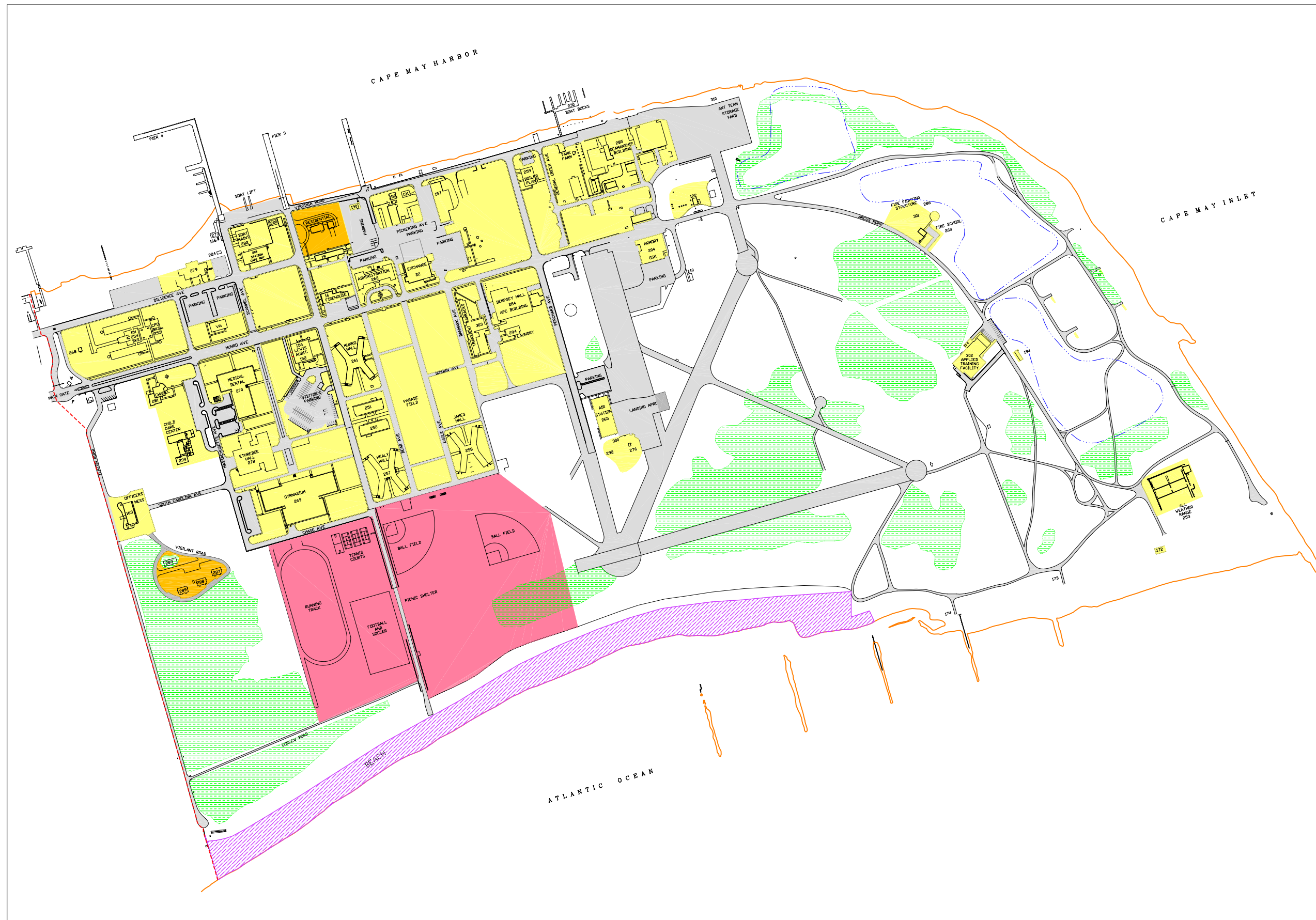


Gino J.M. Giumarro, Wildlife Biologist / Project Manager

Enclosures: TRACEN Cape May Seabeach Amaranth Survey Map

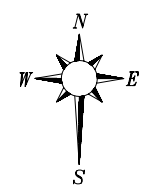
cc: Christopher Hajduk, USCG TRACEN
e²M Project File 4158-001

B. Hoppy, e²M



LEGEND

- Base Boundary
 - High-Tide Line
 - Dredge Spoil Areas
 - TRACEN Detail
- Land Management Units:
- Forested
 - Improved Areas
 - Residential Areas
 - Roads/Impervious Surfaces
 - Outdoor/Recreation
 - Sensitive Species
 - Open Spaces
- Area Surveyed For Seabeach Amaranth



400 300 200 100 0 100
SCALE IN FEET

Figure D-1. TRACEN Cape May
Seabeach Amaranth Survey

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APPENDIX E

DISTRIBUTION LIST OF COMBINED INRMP / EA

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U.S. COAST GUARD TRACEN CAPE MAY AND CONTRACTOR MEMBERS

**Mr. Chris Hajduk – Chief Environmental
Protection & Safety Section**

USCG Training Center Cape May
1 Munro Ave
Cape May, NJ 08204
(609) 898-6889
email: chajduk@tracencapemay.uscg.mil

CDR Klipp – Facilities Engineer

USCG Training Center Cape May
1 Munro Ave
Cape May, NJ 08204
(609) 898-6889

LT Rymer – Chief Maintenance Branch

Mr. Bob Dietz – Chief Engineering Branch

Ms. Kathleen Shilling – Design Section

Training Division Representative

Logistics Division Representative

USCG Training Center Cape May
1 Munro Ave
Cape May, NJ 08204

Mr. Brian K. Hoppy – Senior Ecologist

engineering-environmental Management, Inc.
355 West Lancaster Avenue
Building E, 2nd Floor East
Haverford, PA 19041
(610) 649-8064 1
(610) 649-8675 *fax*
(610) 909-0351 *mobile*
e-mail: bhobby@e2m.net

Mr. Gino Giumarro – Wildlife Biologist

engineering-environmental Management, Inc.
1109 E. Jefferson
Charlottesville, VA 22902
(434) 244-4976
(434) 244-4970 *fax*
(703) 624-4336 *mobile*
e-mail: ggiumarro@e2m.net

FEDERAL, STATE, AND LOCAL NATURAL RESOURCES MANAGER MEMBERS

Mr. Alan Jackson

US Fish and Wildlife Service
New Jersey Field Office
(609) 383-3938 ext 23
email: Allen_Jackson@fws.gov

Mr. Andy Didun

N.J. Division of Fish and Wildlife
P.O. Box 400
501 E. State St., 3rd Floor
Trenton, NJ 08625-0400
(609) 292-2965
email: adidun@dep.state.nj.us

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APPENDIX F

INFORMATION SUPPORTING THE OPERATIONAL COMPONENT PLAN FOR WATERSHED PROTECTION

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OF THIS OPERATIONAL COMPONENT PLAN]***

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APPENDIX G

INFORMATION SUPPORTING THE OPERATIONAL COMPONENT PLAN FOR FISH AND WILDLIFE MANAGEMENT PLAN

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OF THIS OPERATIONAL COMPONENT PLAN]***

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APPENDIX H

INFORMATION SUPPORTING THE OPERATIONAL COMPONENT PLAN FOR GROUNDS MAINTENANCE AND LAND MANAGEMENT

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APPENDIX H-1

**OVERVIEW OF *PRAGMITES* CONTROL PRACTICES
ON THE EAST COAST**

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APPENDIX I

INFORMATION SUPPORTING THE OPERATIONAL COMPONENT PLAN FOR OUTDOOR RECREATION AND PUBLIC ACCESS

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TRACEN CAPE MAY BEACH ACCESS VIOLATION LOG

Date	Individual/Group	Area of Access	Escort (USCG or NJDFW)	Comment on Situation
2/12/02	Pedestrian – J. Smith	From Cape May Beach	USCG (C. Hajdich)	Individual and his dog escorted from the beach. Informed of reasons. Indicated he did not see signage.
Example				

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APPENDIX J

INFORMATION SUPPORTING THE OPERATIONAL COMPONENT PLAN FOR GEOGRAPHIC INFORMATION SYSTEMS

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APPENDIX K

INFORMATION SUPPORTING THE OPERATIONAL COMPONENT PLAN FOR THREATENED AND ENDANGERED SPECIES

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U.S. Department
of Transportation

United States
Coast Guard



Commanding Officer
U.S. Coast Guard Training Center

1 Munro Avenue
Cape May, NJ 08204-5092
Staff Symbol: (e)
Phone: (609) 898-6945

TRACENCMINST 16450

TRAINING CENTER CAPE MAY INSTRUCTION 16450

Subj: ENDANGERED SPECIES MANAGEMENT PLAN

Ref: (a) Endangered Species Act of 1973, Sec. 1531 (1)
(b) Regulations Concerning Training Center Cape May's Jetty and Beach,
TRACENINST 1710.5D

1. PURPOSE. The purpose of this instruction is to document the policies and procedures to protect endangered /threatened nesting shorebirds aboard Training Center Cape May.

2. ACTION.

a. Beach Access:

- (1) The beach area is off limits as per reference (b).
- (2) Access points at the Southwest Gate, Fraser Avenue, and the bunkers are roped off and signs are installed indicating beach closure.
- (3) Boy Scouts who camp behind the Pavilion are notified that there is no beach access from MWR prior to their arrival. This area is also roped off and signs are placed indicating beach closure.
- (4) Access for Security vehicles and Firing Range personnel is allowed to keep unauthorized personnel away from the surface danger zone at the Firing Range. Security vehicles will access the beach via the Air Station and only when there is potential of pedestrians getting into the surface danger zone. They will drive slowly along the low water mark. Firing Range personnel will only access the beach behind the range to assure the area is clear. Access for Security vehicles can be changed dependent on the location of nests.

b. Symbolic Fencing: – In addition to the beach closure:

- (1) An added barrier is erected to ensure complete isolation of the nesting areas. This is done to preclude any disturbance from the access of unauthorized personnel who unknowingly walk their way into the area via the Cape May beach.
- (2) The symbolic fencing consists of string, posts and signs with orange taping for visibility. Training Center personnel from the Environmental Protection & Safety



TRACENCMINST 16450

Section erect the fence. Supplies are provided by the State Division of Fish, Game, and Wildlife.

(3) The fencing is erected in April and taken down in September.

- c. Exclosures. – Piping Plovers only. To protect a nest from predation, a wire fence enclosure is put around the nest. Time and placement of the enclosure is directed by the Division of Fish, Game, and Wildlife. Training Center personnel from the Environmental Protection & Safety Section assist in construction of the enclosure.
- d. Tourist Control. – During the summer months, tourists accessing the beach via Cape May can be a significant problem. Fencing is put up along the southwest gate indicating U.S. Government Property – No Trespassing, but during low tide the signs are a distance away and at times can not be clearly seen. That is the most common excuse heard from tourists. Signs can not be posted at the low tide mark, as they tend to wash away. Security patrols and Division of Fish, Game, and Wildlife personnel continually escort people off the beach.
- e. Section 7 Consultation. – Under the Endangered Species Act (reference (a)), any potential activity that could impact the success of the beach nesting birds must go through a consultation process with the Federal U.S. Fish & Wildlife Service. This is to assure that the activity will not affect the endangered species. Training Center has consulted in the past for field training exercises conducted by the Navy.
- f. Predator Control. – After consulting with State and Federal Wildlife Agencies and reviewing previous years productivity statistics, it was decided that the Training Center should conduct predator control. Animal Services of the U.S. Department of Agriculture Atlantic City office provides the predator control services.

3. DISCUSSION.

- a. Endangered and Threatened Species. There are three species of shorebirds that use Training Center's beach as nesting sites. The Piping Plover is considered federally threatened. The Piping Plover, Least Tern, and Black Skimmer are considered State endangered. Enclosure (1) contains pictures of these species.
- b. Biology and Behavior:
 - 1. The Piping Plover is a small sand-colored shorebird of approximately 7" long with a wingspan of approximately 15". Its cryptic coloration protects the adults and the nest during breeding season. Breeding birds have a single black chest band, black complete eyebrow, white under parts; sand colored back and white rump.

TRACENCMINST 16450

2. Piping plovers are observed at the Training Center in approximately mid-March. By early April, males begin establishing territories, which they defend against rival males. The Plovers nest only on beaches. The territories are approximately 100 yards wide and run from the edge of the dune to the high water mark. Brooding of the clutch and hatching usually occurs in May. They primarily feed at the intertidal area and at the on marine invertebrates and insects.
3. Plovers may renest several times if the nests are destroyed. When this happens, fledglings from late nesting efforts may not fly until late August. Plovers commonly gather in groups prior to their southward migration.
4. During nesting, if the adults are disturbed, they will come off the nest between fifty to a hundred yards of the disturbance to lure the potential predator away. They will use a variety of distraction displays, such as feigning a fake broken wing, squatting, and false brooding to convince the predators, real or perceived, to move away from the nesting site.
5. The biology of the Least Tern and Black skimmer is significantly different from the Piping Plover and will not be discussed, but for the purpose of this plan, their requirements to successfully nest are the same.
 - a. Loss and Degradation of Habitat. – The wide, flat, sparsely vegetated beaches preferred by these species are an unstable habitat, dependent on natural forces for their creation and susceptible to unnatural forces such as development and shoreline stabilization efforts. Destruction of the beach habitat by residential, resort, and seawall development constitutes irreplaceable habitat loss for beach nesting birds. There is very little undisturbed beach left in the State of New Jersey.
 - b. Disturbance of Beach Nesting Birds by Humans and Pets:
 - (1) Increasing human activity during the nesting season has put pressure on beach nesting birds. Activities such as recruit training runs, pedestrians (tourists) walking, sunbathing, kite flying, vehicle traffic, jet skis, fireworks and low flying aircraft jeopardize successful nesting efforts.
 - (2) Concentrations of pedestrians may deter the birds from using a suitable habitat. Incubating plovers will flush when approached within 50-100 yards of the nest. This exposes the eggs to avian predators and excesses to cold and heat. Repeated or extended exposure of shorebird eggs on hot days may cause overheating, killing the embryos, while excessive cooling may kill embryos or retard their development. Pedestrians can also displace unfledged chicks, forcing them out of preferred habitats, increasing their potential for predation, decreasing time spent feeding, and cause unnecessary expenditure of energy.

TRACENCMINST 16450

- (3) Fireworks are highly disturbing to nesting shorebirds. They are also intolerant of kites, more so than pedestrians, dogs, and vehicles. Biologists believe this may be because the kite may be perceived as potential avian predators.
- c. Predation. – Predation has been identified as a major factor limiting reproductive success at many Atlantic Coast sites. Predators of eggs and chicks include red foxes, striped skunks, raccoons, Norway rats, opossums, crows, gulls, grackles, domestic and feral dogs and cats, and ghost crabs. Human activities affect the types, numbers, and activity patterns of predators. Introduced animals such as feral cats and Norway rats are significant predators of shorebird eggs and chicks.
- d. Points Of Contact. – Training Center Cape May works closely with the State of New Jersey Division of Fish, Game, and Wildlife in all aspects of management of the beach nesting birds. Mr. Dave Jenkins and Ms. Sue Canale are the primary POCs for the state and can be reached at their Tuckahoe, NJ office at (609) 628-2103.

S. BRICE-O'HARA

Encl (1): Piping Plover, Least Tern, and Black Skimmer Pictures

DISTRIBUTION: TRACEN SDL #14

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APPENDIX THROUGH THE COMPLETION
OF THIS OPERATIONAL COMPONENT PLAN]***

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APPENDIX L

INFORMATION SUPPORTING THE OPERATIONAL COMPONENT PLAN FOR WETLANDS AND FLOODPLAINS

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APPENDIX M

INRMP UPDATE REPORT FORM AND INRMP MASTER UPDATE LIST

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INRMP Master Update List

Use this INRMP master update list and the INRMP update reports to keep your INRMP current. Consolidate forms from each staff member when completing annual or 5-year INRMP updates.

Log each INRMP update report on this INRMP master update list. Complete this form electronically or in hard copy, and insert into the INRMP. Create more pages as necessary. See the particular INRMP update report for more details on that update.

Report Number	Date Created	INRMP Section / Page	Project/Action
1		/	
2		/	
3		/	
4		/	
5		/	
6		/	
7		/	
8		/	
9		/	
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14		/	
15		/	
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17		/	
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20		/	
21		/	

INRMP Update Report

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Report Number _____
INRMP Section _____, Page _____
Prepared by _____

Type of Update: ☐ *Supplement Existing Project or Action*
☐ *Remove Existing Project or Action*
☐ *Create New Project or Action*

1. Project or action.		
2. Goal / objective for the project or action.		
3. Related projects. List relevant INRMP sections and pages. Indicate if these projects are contingent on completion of project or action listed in 1 above.		
4. Anticipated start / end dates. Indicate whether one-time (e.g., survey) or routine (e.g., monitoring).		
5. Resources needed.		
Initial Costs (+) / Savings (-): \$		Yearly Costs (+) / Savings (-): \$
Installation Labor: hours	Volunteer Labor: hours	Contractor Labor: hours
Equipment:		
Training:		
6. Coordination requirements. Include estimated timeline/schedule.		
Installation Offices/Programs:		
State Agencies:		
Federal Agencies:		
7. Compliance requirements. List appropriate regulations, documentation, permits.		
State:		
Federal:		
8. Briefly describe reason for update.		

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